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ABSTRACT

Seven studies are presented on social and economic topics important to the Kodiak-Shumagin area of the central North Pacific, a major coastal region of Alaska. Data is examined for a period from the 1970s to the early-1980s. Themes underlying the research include change in the socioeconomic framework of the regional city (Kodiak) and in the unique economic patterns of eleven smaller Koniag villages in the Kodiak Island archipelago and on the Alaska Peninsula. Limited information is given for Cold Bay, an enclave community in the Aleutians.

Commercial fishing has long been a key sector of the economy. Of the finfish, five species of salmon are important to local fishermen; these species generally increased in abundance between 1975 and 1983. Pollock are important to non-local fishermen; their abundance in the Shelikof Strait peaked in 1983. Shellfish species include king, tanner, and dungeness crab; and shrimp. King crab have declined precipitously since 1981. Tanner crab have increased while dungeness are thought to be stable. Shrimp were reduced to low levels of abundance in the mid-1970s and have not yet recovered.

The harvesting sector of the Kodiak commercial fisheries industry was extensively transformed between 1975 and 1984; the Chignik harvesting sector remained relatively unchanged. The value of the Kodiak fisheries increased from 1975 to 1981 as a result of crab prices, but declined as stocks fell. Fishermen responded by diversifying into tanner crab, halibut, sablefish and groundfish. Chignik region fishermen continued to take salmon, with little entry into other fisheries. The processing sector also had to adjust. A number of American processors have gone out of business causing a sharp reduction in employment. Japanese firms have become major or part-owners of most of the plants still operating in Kodiak city. Firms are attempting to diversify by producing quality groundfish products.

Kodiak area fishermen have had to adjust constantly to the changes in the resources. The number of Kodiak fishermen, both city and rural, reached a high in 1981. From 1975 to 1980, state loans helped underwrite an expansion in size and number of vessels. Average gross earnings of Kodiak city fishermen peaked in 1978 at nearly $130,000; by 1983 they had dropped to just under $70,000. Average gross earnings for rural Kodiak fishermen were less than half these amounts. Chignik fishermen faced less change; the limited number of permits does not allow additional people to enter the fishery. Their average gross earnings between 1977-83 (except for 1980) were over $100,000.

Subsistence activities take place throughout the area. Salmon, halibut, and deer are the major resources in the Kodiak region; salmon, caribou, moose, and halibut in the Chigniks. The average per-household subsistence harvest for Kodiak Island villages is 83% marine and 17% terrestrial. These villages have higher harvest levels, higher proportions of households participating, a wider variety of species taken, and greater quantities of distribution than the road-connected parts of the Island. Although data is sparse for the Chignik area, subsistence patterns are similar to the Kodiak rural villages; however, there is a wider variance in per-household subsistence harvests in the Chigniks. The village of Chignik Lake has a higher harvest level than any Kodiak Island village, whereas Chignik Bay and Chignik Lagoon have lower ones than any Kodiak village.

Economic change during the study period involved relatively rapid growth from increased fishing production and an expansion of governmental expenditures. Major forces causing change were external: increased purchases of fishing and tourist resources and increased state and federal expenditures. Employment in these sectors grew by almost 40% during the period; incomes earned expanded even more. Responses to the externally generated activities occurred in the local support and household sectors. The local support sector response is described by the multiplier; between 1975 and 1980 it increased over 20% The support sector expanded more rapidly than the external sector. This response was the result of an increase in the size of the market. The household sector responded in two ways. First, residents expanded their participation in the market economy; labor force participation rose. Second, the region experienced in-migration.

If the regional economy were to respond to OCS development in a similar way to that found in this analysis, then oil and gas activities would result in an expansion of support sector employment, which most likely would be more than proportional to the level of OCS activity. However, the validity of the assumption that this study's patterns of change can be used to project the effects of OCS development needs additional confirmation.

Public sector expenditures and activities are crucial to the regional economy. Despite data inadequacies, summary information gives a measure of the relative level of public sector spending. FY1983 was chosen as a benchmark because state expenditures were at or near their peak in real terms. Together, identified state and federal expenditures in the region (including Cold Bay) totaled close to $127 million. This number is probably conservative since data availability tended to exclusions rather than additions. The funds were largely generated outside the region and thus are an injection into the local economy. The state/federal split is 51% state and 49% federal expenditures. Although the latter tend to be more stable, they have a smaller local impact because of leakages associated with a Coast Guard installation. Any analysis of future economic trends must carefully consider changes in the levels of government spending.

Outdoor recreation and tourism are important aspects of the local economy, although data shortcomings make it hard to determine their effects. The best estimates suggest that one-quarter of the sales, wages, and employment in the town of Kodiak are generated from outdoor activities and nonresident tourism. Residents place a high value on outdoor undertakings, but are concerned about conflicts they perceive surrounding them. Much of the land in the study area is federally managed, primarily as wildlife refuges. Agency management plans were being prepared at the same time data was being gathered for this study. The policies established by these plans, along with the regulations implementing them, will influence popular activities such as sport fishing, hunting, sightseeing and camping. State fish and game regulations also impact outdoor recreation in the area.

Infrastructure investment, both public and private, in the town of Kodiak was higher during the study period than historically. Extensive changes in the physical capital of the town's economy were made in the late 1970s and early 1980s. Major public investments included a power project, larger harbor facilities, and expanded water and sewer systems. The private economy matured, with greater competition in the consumer sectors. This investment growth came primarily from the expansion of government spending and the fisheries boom. Employment from infrastructure expenditures had relatively small effects; the larger the project the smaller the proportion of local workers. This stemmed from the composition of skills in the resident population. Living costs for regions like the Kodiak-Shumagin area are recognized as being higher than for urban locations like Anchorage and Seattle. Unfortunately, reliable data are difficult to obtain. The Consumer Price Index is one cost of living indicator; it suggests that food prices in Kodiak city have remained high relative to Anchorage and Seattle. During the study period population growth increased market size and economies of scale expanded distribution; competition increased with the market growth; and transportation costs decreased. While it is not possible to specify the effects of these changes on Kodiak city's cost of living, residents felt that prices did not fall much but that product diversity and availability improved.

The sociocultural systems of the town of Kodiak changed with the build-up and subsequent deterioration of the region's fishing economy. For those involved in fishing, concerns were expressed about loss of income, closure of processing plants, decline of vessel value, rapidly escalating insurance rates, the uncertain availability of experienced crew members, and increased safety risks. Processors trying to diversify found start-up problems, the maintenance of a stable workforce, and obtaining a consistent supply of fish to be major difficulties. Fishing families responded differently: some moved from the area to try fishing elsewhere, some quit altogether, others tightened their belts and persevered. Strains are felt as vessels are repossessed for non-payment of loans, second jobs are taken outside fishing, and families are forced to change their lifestyle. Divorces, domestic violence, alcohol and drug abuse, and mental health problems have increased. While no clear-cut causal connection between the economic downturn and these increases can be demonstrated, professional workers in the town of Kodiak agree a link exists. Many fishermen turned to political action to seek remedies for the economic difficulties. Organizations representing fishing interests were seeking a united front, although some factionalism existed. Local governments were becoming involved, a new trend. Attitudes toward OCS activities were changing. During the boom period, fishermen expressed strong opposition to offshore petroleum work; later the attitude became one of accommodation and interest in OCS development.

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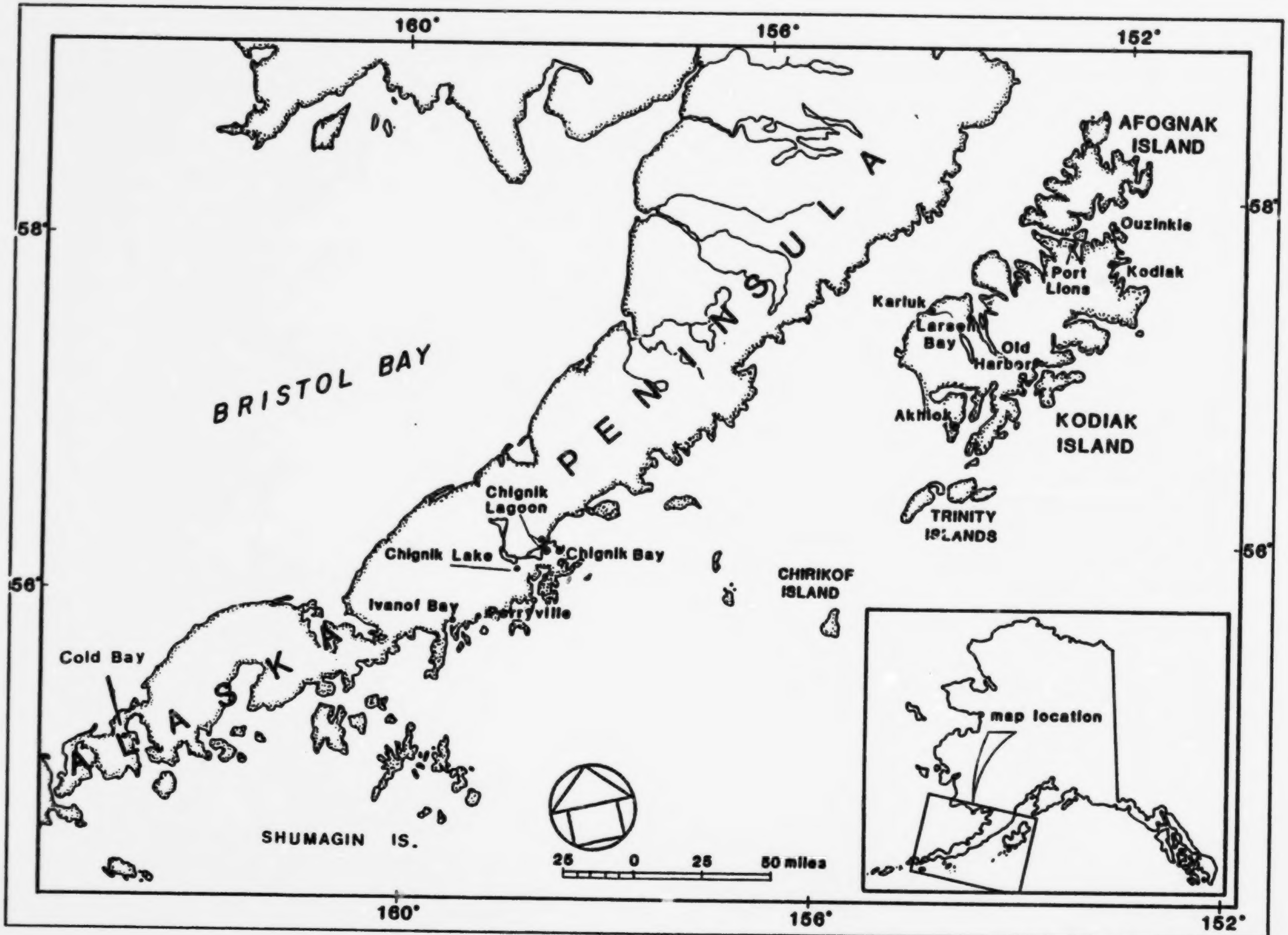
LIST OF ACRONYMS

ACCA	Alaska Coastal Community Alliance
ADA	Alaska Draggers' Association
ADFG	Alaska Department of Fish and Game
AHFC	Alaska Housing Finance Corporation
CFAB	Commercial Fisheries and Agricultural Bank
CFEC	Commercial Fisheries Entry Commission
CPI	Consumer Price Index
CSA	Community Services Administration
CWF	Columbia Wards Fisheries
CZMA	Coastal Zone Management Area
DCRA	Department of Community and Regional Affairs
EDA	Economic Development Agency
FCMA	Fisheries Conservation and Management Act of 1977
FCZ	Fisheries Conservation Zone
INPFC	International North Pacific Fishery Commission
IPHC	International Pacific Halibut Commission
KANA	Kodiak Area Native Association
KCA	Kodiak Council on Alcoholism
KHFA	Kodiak Halibut Fishermen's Association
MMS	Minerals Management Service
NMFS	National Marine Fisheries Service
NPFMC	North Pacific Fishery Management Council
OCS	Outer Continental Shelf
REAA	Rural Education Attendance Area
UFMA	United Fishermen's Marketing Association


160°
156°
152°
58°
56°
BRISTOL BAY
ALASKA PENINSULA
AFOGNAK ISLAND
Ouzinkie
Port Lions
Kodiak
Karluk
Larsen Bay
Old Harbor
Akhiok
KODIAK ISLAND
TRINITY ISLANDS
CHIRIKOF ISLAND
Chignik Lagoon
Chignik Lake
Chignik Bay
Ivanof Bay
Perryville
Cold Bay
SHUMAGIN IS.
25 0 25 50 miles
map location

Cultural Dynamics 1986

FRONTISPIECE: THE STUDY AREA

XXIV

I. INTRODUCTION

The Kodiak-Shumagin region is one of Alaska's distinctive coastal areas, the location of centuries of trade between indigenous peoples, and the site of some of the earliest incursions of Europeans. This volume presents, reviews, and analyzes information about selected aspects of the socioeconomics of the area. A special effort was made to place the findings in recent historic perspective, and to examine economic factors over a specific interval. The time span examined generally is 1970 through 1984, a period of rapid growth and subsequent collapse of some key fisheries resources. By examining this "boom and bust" cycle, insights are gained about the possible effects of outer continental shelf (OCS) oil and gas development activities. In addition to the major endeavor of charting economic elements through time, this volume updates earlier descriptions and develops new information about the role of fisheries and public sector funding in the regional economy. Readers should be alert to the fact that the data base for this volume does not extend later than 1984-85.

The study area includes that portion of the central North Pacific between the Northern Gulf of Alaska and the Aleutian Islands, between 54° and 59° north latitude and 152° and 164° west longitude. The coastal area includes the Kodiak-Afognak island cluster and the southern coast of the Alaska Peninsula. The major regional town is the City of Kodiak. Eleven Koniag villages are in the study area--five on the Pacific Ocean (southeastern) side of the Peninsula: Ivanof Bay, Perryville, Chignik Lake, Chignik Lagoon, and Chignik Bay; and six in the Kodiak Island archipelago: Karluk, Larsen Bay, Akhiok, Old Harbor, Ouzinkie and Port Lions. Cold Bay is an enclave community, occupied primarily by transient technical personnel, that services transportation and communication to and from the Aleutian Islands chain (see Frontispiece).

This study will be of use to many audiences: the people who live with the ocean and land that characterizes the region; policy-makers held responsible for decisions affecting the economic, political, and social future of the citizenry; technical professionals charged with preparing environmental impact statements; industry leaders interested in future ventures in the region; and scholars searching for greater understanding of this area of the North Pacific.

Each chapter addresses a segment of the socioeconomic structure of the region, and each reflects the special perspectives derived from the intellectual discipline and analytical tools of the author. Three economists, two anthropologists, and a specialist in outdoor recreation contributed to the volume. Although each chapter stands alone as a major component of the analysis, combined they provide an unusually comprehensive insight into the region, a contribution unique to the interdisciplinary approach.

The next chapter, on the commercial fishing industry, is by Stephen J. Langdon, an anthropologist with the University of Alaska, Anchorage. The range of resources, harvest patterns, and fluctuations in the resource base are documented with tables and figures and evaluated through narrative and analysis. The relative significance of the fisheries in the two areas, Kodiak and Chignik, is discussed. The response of the processing sector, the communities, and fishermen to changing conditions is also included.

The third chapter, on subsistence activities, is also by Langdon. Here he analyzes and compares harvest data by species, by community, and by region, providing a valuable baseline for future studies. For the Kodiak communities, the data were gathered in 1982 primarily by the Kodiak Area Native Association and the Alaska Department of Fish and Game, Subsistence Division; for the Chignik area, ADFG preliminary subsistence data from 1983-84 were used.

The fourth chapter provides an analytic framework for evaluating the regional economy. It was prepared by Lee Huskey, an economist with the University of Alaska, Anchorage. By using a regional accounts framework as the means, the end result is an analysis of economic change in the Kodiak-Shumagin area. The assumption can then be made that the changes during the rise and fall of the fishing sectors may parallel the impacts of OCS development. The insights provided concerning the effects of external and internal factors on regional economies reaches far beyond the boundaries of this geographic region.

The fifth chapter, on public sector expenditures, is by Dona Lehr, an economist with the University of Alaska's Institute for Social and Economic Research. To our knowledge, no other analysis of the effects of government activities on a regional economy is as comprehensive and detailed as this one. The documentation of state and federal funds, their sources and distribution, provides not only baseline data for comparison with future change in the area, but also serves as a model of how economic data on government spending can be collected, integrated and analyzed on a regional level.

The sixth chapter, on outdoor recreation and tourism, is by Richard Krause, an Anchorage consultant. The economic benefits of both outdoor recreation and tourism appear to be substantial, but the absence of comparable data makes it difficult to determine the extent of the benefits. Much of the land in the study area is federally managed, primarily as wildlife refuges. The continuing enthusiasm of residents for outdoor recreation and the increasing interest of outsiders in visiting are documented.

The seventh chapter, on Kodiak city infrastructure investment, is by P. J. Hill, an economist at the University of Alaska, Anchorage. Here the effects of the recent expansion of both private and public infrastructure, especially through major public projects, are described. The relation of this growth to factors such as prices and to other aspects of the economic development of the major regional city, Kodiak, are analyzed.

The eighth chapter, on Kodiak city sociocultural systems, is by James Payne, an anthropologist now with Alaska Pacific University. The effects of the rise and the decline of the fishing industry on different parts of the community are examined. Central are fishermen and their families. Also included are social and other services provided by the city of Kodiak and the Kodiak Island Borough. Highlighted are key reponses to the "boom and bust," such as increased political action among the fishermen.

Finally, the last chapter summarizes the major findings of this compendium of studies about the Kodiak/Shumagin area of the North Pacific.

This volume on the social and economic systems of the Kodiak-Shumagin region is supplemented by a companion account (Technical Report No. 121) that provides sociocultural descriptions and analysis of the study area's small communities (Davis 1986). Combined, the two reports document a particular time in the history of events in the North Pacific, primarily 1970 to 1985, and provide citizens in the region and the Minerals Management Service with baseline information needed for future deliberations and studies concerning development in this area of Alaska.

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II. COMMERCIAL FISHING IN THE KODIAK-SHUMAGIN REGION

by Stephen J. Langdon, Ph.D.

Introduction

Marine resources have been the foundation of human settlements, economies and cultures of the Kodiak and Chignik regions of Alaska ever since human occupation began some 5-6,000 years ago (Clark 1974:11). In the 20th century, commercial fisheries have played a major role in the two regions as local harvesting and processing of various finfish and shellfish species for sale on world markets has provided the economic foundation for communities and the source of cash income for many households. Whereas salmon were the most important species during the first 60 years of this century, crab dominated for the next 20 years and now an era of a more diversified fishery appears to be coming to the two regions. Despite recent shifts, crab and salmon continue to be the most important component of the commercial fisheries, especially in the Chignik area. Dramatic and profound forces are presently at work in the commercial fisheries of the region as the industry attempts to cope with the shock of the decline of the king crab fishery and to adjust to the political and economic complexities of groundfishing.

This chapter provides a description of the present status of commercial fisheries in the Kodiak and Chignik regions and analyzes recent trends that suggest possible future directions. The analysis is divided into three sections; in each section the Kodiak and Chignik regions are dealt with separately. The first section deals with the resources, identifying commercial species and their distribution, describing their recent and present biological status, and tracing recent commercial harvest levels. This is done by dividing the resources into finfish and shellfish categories as is the practice by the biological managers of the resources. The sole exception to this organizational strategy is that groundfish resources of the two regions are jointly discussed in the Kodiak section.

The second section deals with the commercial fishing industry; it is divided into separate discussions of the harvesting and processing sectors. Topics covered in the analysis of harvesting include changes in fleet composition, patterns of species mix, locations of harvests, earnings and costs, and patterns of limited entry permit ownership by residency, as well as changes from transfers and migration. Fishermen's organizations also are treated in the harvesting discussion. Under the processing sector the location, age, and ownership, of the plants is discussed. Also taken up in this section is the nature of the processing workforce. A separate section is devoted to the recent development of groundfishing in Kodiak, attempting an integrated view of this new component of the industry. The participation of foreign fleets in this fishery is reviewed in this section. Interested readers will find additional details on the economics of the fisheries in the subsequent discussions, especially Chapters IV, VII, and VIII.

The third section looks at the place of the commercial fisheries in the communities of the two regions. Patterns of limited entry permit ownership and implications of the trends in local ownership for community economies are discussed. Patterns of crew composition of different segments of the fleet and employment implications for local community economies also are noted. A general characterization of recent trends in the nature of commercial fishing and its integration into the way of life of these communities concludes the analysis.

METHODOLOGY

Information was obtained from a variety of sources including fieldwork with industry members in various communities, primary statistical data from state records, published reports, and other documentary sources. Focused discussions were conducted in Kodiak with leaders of fishermen's organizations, superintendents of processing plants, fishermen, labor representatives, and the local Sea Grant agent. Additional data were obtained on Kodiak and Chignik villages from Dr. Nancy Davis, who conducted fieldwork in those communities for this project (Davis 1986).

Primary data was obtained from the Commercial Fisheries Entry Commission on anonymous individual fishermen's gross earnings by community for the period 1975-1983. A fisherman is defined as the gear license holder who is required by law to sign fish tickets. In most cases this is a vessel operator or captain. (Crewmen are not included in the figures.) Halibut data were not available for the years 1975, 1976 or 1983. Confidential information on gear types, vessel size, and gross earnings by species were provided on a community basis to protect individual fishermen. Summaries of vessel characteristics by community over the period from 1975-1983 were also provided from CFEC files.

A number of secondary published reports were accessed to provide information necessary for this report. Important sources included:

- Reports on permit transfer patterns and fleet characteristics from the Commercial Fisheries Entry Commission (CFEC);
- Annual Alaska Department of Fish and Game (ADF&G) commercial fisheries division finfish and shellfish management reports for the Kodiak and Chignik areas and districts;
- ADF&G subsistence division reports on Kodiak subsistence activities;
- ADF&G habitat division's Southwest Regional guide on species and their human use;
- National Marine Fisheries Service Status of Stocks documents on Gulf of Alaska groundfish.

A variety of other state and MMS reports, newspaper and magazine articles were used to develop the material presented in this report.

The Resources

The following commercially important species are discussed in this section: finfish--salmon, herring, halibut, groundfish--followed by shellfish--king crab, tanner crab, dungeness crab, shrimp, and miscellaneous species. The Kodiak region is treated first followed by a discussion of the Chignik region.

KODIAK

The commercial fisheries of the Kodiak region from the shore to three-miles out are under the management authority of the State of Alaska for all species except halibut. Halibut is biologically managed by the International Pacific Halibut Commission (IPHC), a treaty-mandated international commission with Canadian and United States representatives. The North Pacific Fishery Management Council, the federal regulatory body responsible for management of fisheries resources in the fisheries conservation zone (FCZ) from three to 200-miles offshore, exercises jurisdiction over seasons, technologies, and other human components of the fishery. The North Pacific Fishery Management Council is responsible for biological and other management of all species (except tuna) from three to 200-miles offshore.

Management of fisheries resources under State jurisdiction is the day-to-day responsibility of the Commercial Fisheries Division of the Alaska Department of Fish and Game and the Fish and Wildlife Enforcment Division of the Department of Public Safety. Both agencies implement the imperatives of the State Constitution, State Statutes as passed by the legislature, and regulations approved by the Board of Fisheries. The Board of Fisheries is the primary regulatory establishing body. Composed of seven "informed laymen" appointed by the Governor, the Board of Fisheries meets regularly to set regulations on matters such as harvest level, gear types, areas, times, and other related matters essential to the conduct of the commercial fisheries.

The Kodiak Management Area

The Kodiak archipelago (Kodiak, Afognak, and the smaller islands) has been treated as a distinct management area for finfish by the Commercial Fisheries division of ADFG since statehood. The mainland district on the southside of the Alaska Peninsula, which stretches from Cape Douglas on the north to Kilokak Rocks in the south, is included in the Kodiak area due to its proximity to the archipelago and to its primary use by fishermen from Kodiak Island communities. The Kodiak Management Area is described by the Alaska Department of Fish and Game as comprising all waters of Alaska from the southern entrance of Imuya Bay near Kilokak Rocks northeast to Cape Douglas, including Kodiak, Afognak and adjacent islands (see Figure 1).

The Kodiak Management Area is conceived as a separate management unit for finfish resources--salmon, herring, and groundfish. Slightly different statistical areas are used for shellfish and are discussed below. Biologiacal data on the first two of these species are organized into a hierarchy of geographic units which emphasizes the rivers, bays, and inshore waters which are critical to spawning, reproduction, and maintenance of the stocks. The primary aim of management is to insure that optimal numbers of separate stocks survive commercial fishing and other sources of predation to allow high levels of sustained production to occur. For purposes of salmon management, the hierarchy of geographic units from most inclusive to least inclusive, presented in Figure 1, is as follows:

Management Area - Kodiak Management Area;

District - nine units named as follows beginning at the north end of the archipelago and proceeding clockwise: Afognak, General, Alitak Bay, Red River, Sturgeon River, Karluk, Uyak Bay, Uganik and Mainland (on the Alaska Peninsula) Districts;

Section - example, Chiniak and Sitkalidak Sections within the General District;

Geographical Area - example, one of ten three-digit labelled units--the numbered geographical areas are 251, 252, 253, 254, 255, 256, 257, 258, 259, and 262;

Statistical Sub-Area - example, a three-digit number followed by a hyphen and a two-digit number, such as 251-10 or 251-20, which constitutes a subdivision of the geographic area.

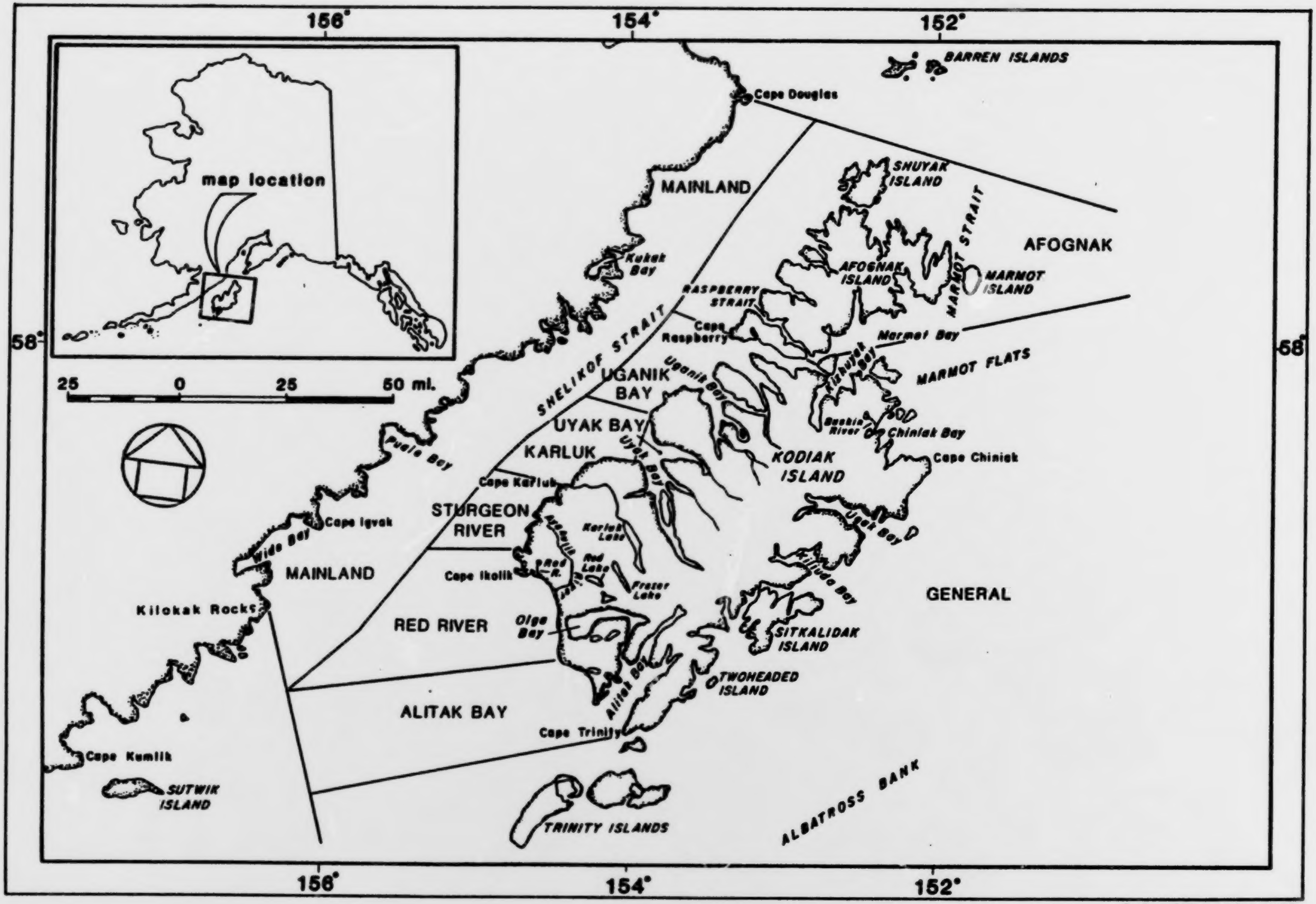
Data on salmon streams (escapement estimates--termed indexes and weir counts) and harvests are recorded according to this system. It should be noted that a geographical area may be composed of from one to eighteen statistical sub-areas (there is no theoretical limit to the number of subareas). Further, a section may be composed of one or more geographical areas and a district, in turn, may not be subdivided into sections.

Finfish

Salmon. All five species of Pacific salmon common in the waters northwestern North America are found in the approximately 300 spawning systems in the Kodiak management area and are caught by commercial fishermen. The species are commonly referred to by the following names:

king, chinook (*Onchorynchus tshawytscha*)
sockeye, red (*Onchorynchus nerka*)
silver, coho (*Onchorynchus kisutch*)
chum, dog (*Onchorynchus keta*)
pink, humpy (*Onchorynchus gorbuscha*)

The five salmon species are similar in that all are anadromous, which means that they are spawned in freshwater streams and rivers, migrate to the ocean where they grow and mature and then return to their natal streams to spawn and die. The species differ in a number of behavioral characteristics including their size, age of migration to the ocean, time spent in the ocean phase, preferred stream habitat, and period of time they survive upon returning to freshwater.


156°
154°
152°
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map location
25 0 25 50 mi.
BARREN ISLANDS
Cape Douglas
MAINLAND
SHUYAK ISLAND
AFOGNAK
Kukak Bay
AFOGNAK ISLAND
MARMOT STRAIT
MARMOT ISLAND
RASPBERRY STRAIT
Cape Raspberry
Marmot Bay
SHELIKOF STRAIT
MARMOT FLATS
UGANIK BAY
Uganik Bay
Kizhuyak Bay
UYAK BAY
Buskin River
Chiniak Bay
KARLUK
Uyak Bay
KODIAK ISLAND
Cape Chiniak
Puale Bay
Cape Karluk
STURGEON RIVER
Cape Igvak
Karluk Lake
Ugak Bay
Wide Bay
Red R.
Red Lake
MAINLAND
Cape Ikolik
Kiliuda Bay
Frazer Lake
GENERAL
Kilokak Rocks
RED RIVER
Olga Bay
SITKALIDAK ISLAND
TWOHEADED ISLAND
Alitak Bay
ALITAK BAY
Cape Trinity
Cape Kumlik
SUTWIK ISLAND
ALBATROSS BANK
TRINITY ISLANDS

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FIGURE 1.

KODIAK MANAGEMENT AREA SALMON DISTRICTS

The king salmon is the largest (with an average weight of 20 pounds) and the rarest of the five species occurring naturally in only the Karluk and Ayakulik Rivers on Kodiak Island; they were artificially introduced into the Dog Salmon and Pasagshak Rivers. They are generally available in Kodiak nearshore waters from mid-March to early July. The sustained yield of king salmon to Kodiak systems is estimated to be around 13,500 fish (Jacobs 1984:5-18).

Pink salmon are the most ubiquitous and abundant of the five species in Kodiak waters. With an average weight of 3-4 pounds, pink salmon are the smallest. They spawn in approximately 300 stream and river systems as well as intertidally at the outlet to freshwater systems in certain locations. Between 60 and 85 percent of total pink salmon escapement normally is accounted for by less than 50 streams (ADF&G 1985a:349). From early June to early September pink salmon are normally available in Kodiak bays, estuaries and streams. The sutained yield to Kodiak streams is estimated to be 15.6 million (Jacobs 1984:5-18).

Reds are found in 30 Kodiak systems with major runs occurring in the Karluk, Ayakulik, and Upper Station Rivers. Average weight is from 5-7 pounds. Reds have the distinctive species characteristic of spending from one to two years after birth in a freshwater lake before migrating to the ocean. They are available in Kodiak waters from late May until August. Their sustained yield is estimated to be 2,331,000 fish (Jacobs 1984: 5-18). They are a most valuable commercial salmon species because they bring the highest price per pound.

Coho salmon are the latest returning and the least studied of the salmon species. They are relatively rare but spawn in a substantial number of streams. Coho average between six and eight pounds in size at maturity. They are generally available from August until October in Kodiak waters. A conservative estimate of about 200,000 coho annually returning to Kodiak stream has been suggested (Jacobs 1984: 5-18).

Chum salmon are second only to pink salmon in abundance and ubiquity, often being found in the same streams. Chum salmon are the second largest, typically averaging between eight and ten pounds at maturity. Adults return to spawning streams from early June to early September. The sustained yield is estimated for Kodiak at 1,727,000 chum salmon.

The total run of salmon returning to Kodiak area streams has been extraordinarily strong in the past decade due to a combination of factors including mild winters, warm ocean waters, and successful regulatory restraint of harvests. Substantial escapements have resulted. Table 1 provides data on indexes (estimates) of pink, chum, and red escapement for the period 1962-1984. For all three species, escapements have averaged 50 percent higher during the last 10 years than the average for the entire 22-year period. Table 2 presents total salmon harvests by species and fish since 1948. Pink salmon are clearly the most abundant species.

The overall average harvest over the period from 1948-1984 is a little over eight million fish. The even years produce on average a little over ten

TABLE 1

ESCAPEMENT INDICES BY SPECIES FOR KODIAK AREA STREAMS
1963-1984
(Numbers of Fish)

YEAR	PINKS	CHUMS	REDS
1962	4,600,000	297,900	922,500
1963	1,026,075	75,520	502,227
1964	3,360,000	261,429	600,346
1965	772,874	67,156	561,980
1966	2,100,000	143,700	652,578
1967	698,710	136,079	720,683
1968	2,800,000	121,000	645,612
1969	1,581,335	77,285	592,020
1970	3,392,577	123,150	573,603
1971	1,070,173	249,327	456,197
1972	1,053,391	335,115	605,491
1973	604,592	258,044	543,111
1974	2,041,099	86,383	995,925
1975	1,100,555	156,761	704,801
1976	3,105,320	312,914	1,075,226
1977	2,212,488	742,384	1,269,374
1978	5,006,273	482,956	1,000,353
1979	3,067,647	607,430	1,410,800
1980	6,492,822	830,070	1,831,748
1981	3,188,869	741,981	1,391,593
1982	5,370,049	1,023,923	1,603,692
1983	2,089,704	824,954	1,300,506
1984	4,512,124	682,936	1,467,780
1963-1984 Average	2,446,880	364,645	906,565
1963-1984 Odd Year Average	1,583,002	-	-
1963 - 1984 Even Year Average	3,472,153	-	-

SOURCE: ADF&G 1984c

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TABLE 2

KODIAK MANAGEMENT AREA SALMON HARVESTS BY SPECIES, 1948-1984
(Numbers of Fish)

Year	Kings	Reds	Cohos	Pinks	Chums	Total	Total Pounds*** (Millions)
1948	1,401	1,260,465	32,364	5,958,487	330,795	7,583,512	
1949	851	892,336	55,737	4,927,779	699,548	6,574,251	
1950	2,127	920,885	40,653	5,304,701	685,109	6,953,475	
1951	2,204	470,173	47,724	2,005,947	422,179	2,948,227	
1952	961	631,094	35,875	4,553,697	983,800	6,205,427	
1953	2,927	391,855	38,889	4,947,481	490,012	5,871,164	
1954	906	329,370	56,426	8,325,034	1,139,763	9,851,499	
1955	2,468	164,482	34,582	10,794,164	482,425	11,478,121	
1956	576	306,194	54,215	3,349,203	660,326	4,370,514	
1957	1,023	234,127	35,028	4,690,994	1,152,416	6,113,588	
1958	1,942	288,014	20,555	4,038,938	930,698	5,280,147	
1959	1,837	330,087	14,512	1,799,675	733,784	2,879,895	
1960	1,191	362,194	54,213	6,684,798	1,133,412	8,199,808	
1961	864	407,979	28,579	3,926,023	518,935	4,882,380	
1962	1,095	784,664	53,831	14,188,745	794,717	15,823,052	
1963	286	407,040	57,011	5,480,158	305,061	6,249,556	
1964	1,302	477,938	35,567	11,861,785	932,219	13,299,811	
1965	786	346,137	26,672	2,886,831	431,340	3,691,766	16.5
1966	593	631,650	67,681	10,755,582	762,765	12,218,271	51.9
1967	962	283,588	10,083	187,813	221,149	703,595	4.6
1968	1,936	760,348	56,013	8,760,533	749,854	10,328,684	40.8
1969	2,241	603,798	35,126	12,492,576	536,808	13,670,549	58.8
1970	1,089	917,057	66,426	12,045,586	919,306	13,949,464	56.4
1971	920	478,195	22,844	4,332,994	1,541,227	6,376,180	31.2
1972	1,300	221,604	16,646	2,485,802	1,164,526	3,889,878	19.6
1973	800	167,341	3,573	511,708	317,921	1,001,343	5.9
1974	542	415,236	13,329	2,646,097	247,879	3,323,073	16.1
1975	101	135,418	23,659	2,942,801	84,431	3,187,410	14.1
1976	766	641,484	23,714	11,077,992	740,495	12,484,451	55.2
1977	585	623,468	27,920	6,252,405	1,072,313	7,976,691	40.1
1978	3,228	1,071,782	48,795	15,004,065	814,345	16,942,215	70.5
1979	1,905	631,735	140,629	11,287,591	358,400	12,420,260	50.4
1980	529	651,394	139,154	17,290,615	1,075,557	19,157,249	69.8
1981	1,418	1,288,980	121,544	10,336,829	1,345,328	13,094,099	59.5
1982	1,238	1,204,793	343,531	8,076,203	1,266,187	10,891,952	50.3
1983**	3,839	1,231,989	157,618	4,603,371	1,085,165	7,081,982	34.4
1984	4,657	1,950,639	229,534	10,884,293	649,092	13,678,205	
1949-1983 ODD-YEAR AVERAGE	1,445	504,929	48,985	5,245,575	655,469	6,456,403	
1948-1982 EVEN-YEAR AVERAGE	1,257	627,727	47,968	8,490,098	851,764	10,018,814	
1948-1983 AVERAGE	1,354	564,029	48,917	6,759,505	753,617	8,127,422	

* Catches prior to 1948 were estimated from casepack production.
** Preliminary.
*** Extrapolated

SOURCE: ADF&G 1984c and 1983 Kodiak Area Annual Management Report million fish, over three and a half million more than the odd year average of about 6.5 million fish. This pattern is the result of many pink salmon stocks being available only in even years. Commercial salmon harvests have been at historic highs from 1976 to the present. The overall total average harvest from 1976-1984 is 12,636,000 fish, 55 percent greater than the 35-year average from 1948-1983. Post World War II highs for four of the five species have been recorded in recent years: pinks, 1980; cohos, 1982; reds and kings, 1984.

Table 3 provides data on the geographic distribution of harvest in the Kodiak management area from 1975 to the present. The General District, comprising the entire west coast of Kodiak Island, is both the largest district and is also clearly the greatest producer, averaging 23.4% of total harvests over the period. Production from this district never fell below 10 percent during the 9-year period reviewed. The Alitak Bay and Uganik Bay districts were equally productive over the period and second to the General District, averaging 16.8 and 16.5 percent respectively over the 1975-1983 period. The Karluk and Uyak Bay districts combined for a total average contribution of 10.9 percent; the Afognak District averaged 10.2 percent, and the Mainland District 7.9 percent of total harvest. The Red River and Sturgeon River districts averaged 8.4 percent and 5.1 percent respectively; their averages, however, mask the huge difference in production from high levels in even years to almost nothing in odd years.

Herring. Herring (Clupea harengus pallasi) are found throughout the waters of the Kodiak archipelago and in several bays along the southside of the mainland. The annual cycle involves occupation of deeper waters offshore during the winter (from October to February) with schooling and subsequent migration inshore beginning in March and April. By late April, early spawning stocks have begun to deposit layers of eggs, usually in intertidal and subtidal areas on aquatic vegetation such as rockweed and eelgrass. Late spawning occurs into June for a few Kodiak area stocks. Unlike salmon, herring do not die following spawning but rather continue to live. It is believed that rearing areas for a given population occur in the same bay in which the population spawns (ADF&G 1985a:459). Although information on the behavior of herring after spawning is limited, it appears they gradually move offshore to deeper waters in the general vicinity of their spawning locations through late summer and fall (Lechner 1985). Herring become sexually mature at age two and are known to live to 15; however, mortality rates rise sharply after age five.

Herring are managed as 35-40 discrete stocks based on spawning locations throughout the Kodiak Management Area. Spawning concentrations in different bays are treated as discrete stocks and appear to be independent of each other. Figure 2 indicates the district divisions used by ADF&G to manage herring stocks. Winter concentrations have been found through commercial harvesting in Uyak, Terror, Viekoda, and Alitak Bays and in Kupreanof Straits (ADF&G 1985a:459). Present distribution may not be as extensive as in the past due to high levels of harvest in the 1930s and 1940s when an average of over 30,000 tons were taken annually. Estimates of biomass have recently been made through aerial surveys. The surveys are not estimates of total Kodiak area herring biomass but only of those stocks

TABLE 3

KODIAK MANAGEMENT AREA TOTAL CATCH BY DISTRICT, 1975-1983
(Catch in thousands of fish)

DISTRICT
(Geographical Areas)

	Afognak		Uganik Bay		Karluk and Uyak Bay		Sturgeon River	
	(251,252)		(253)		(254)			
YEAR	Catch	%[1]	Catch	%	Catch	%	Catch	%
1975	492.7	15.5	1108.0	34.8	354.0	11.1	30.1	.9
1976	818.3	6.6	1603.8	12.8	1279.8	10.2	315.6	2.5
1977	657.5	8.2	1376.8	17.3	969.5	12.1	11.1	.1
1978	1235.4	7.3	1286.6	7.6	1583.4	9.3	1474.3	8.7
1979	1154.2	9.3	2281.7	18.4	1752.2	14.1	25.0	.2
1980	2122.9	11.1	2152.9	11.2	1140.3	5.9	4774.1	24.9
1981	2305.1	17.6	2003.5	15.3	1385.0	10.6	2.2	--
1982	1102.9	10.1	1859.8	17.1	808.3	7.4	939.3	8.6
1983	448.5	6.3	967.8	13.7	1200.8	17.0	5.7	--
Average Percentage of Total Catch		10.2		16.5		10.9		5.1

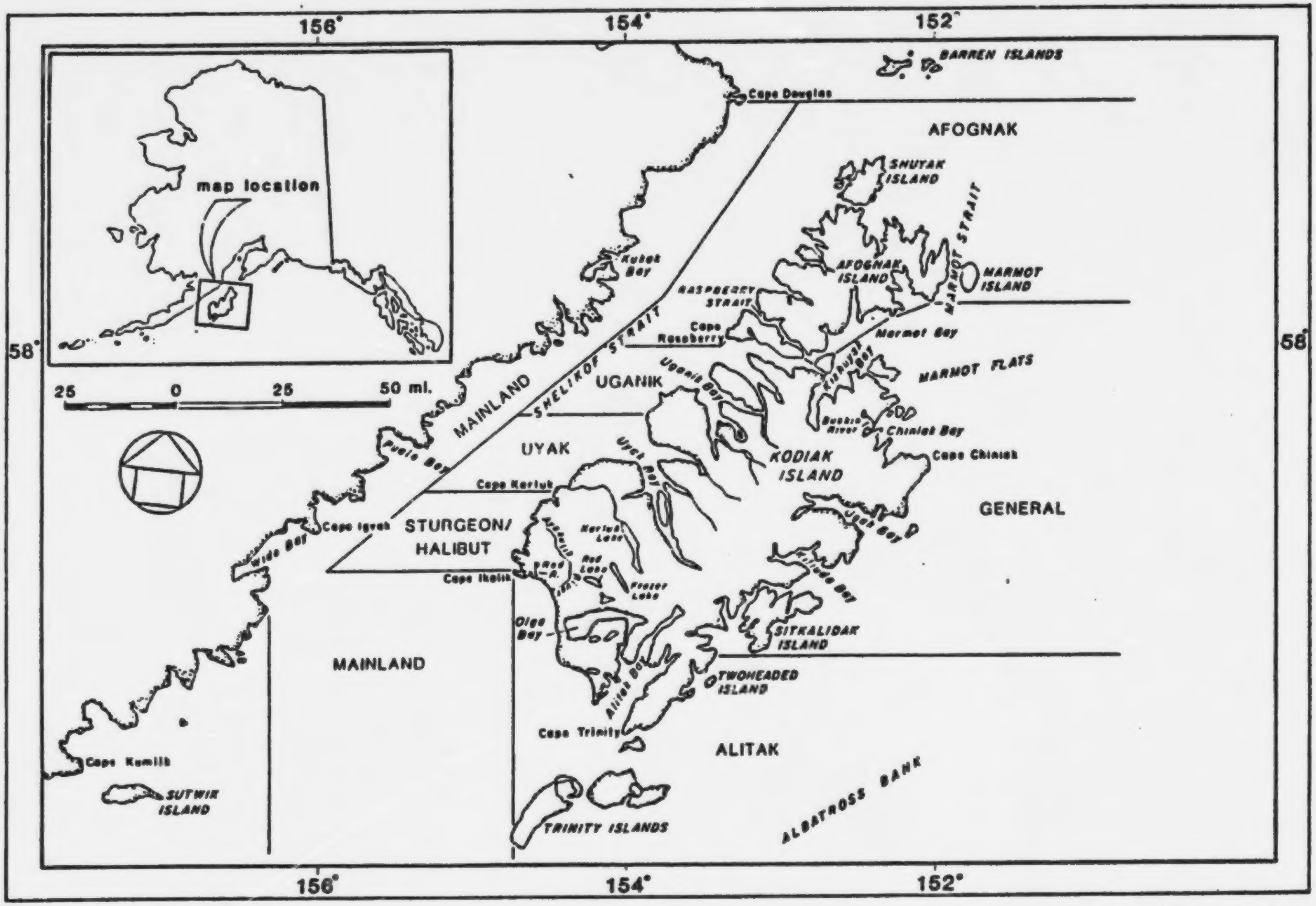
DISTRICT
(Geographical areas)

	Red River		Alitak Bay		General		Mainland	
	(256)		(257)		(258, 259)		(262)	
	Catch	%[1]	Catch	%	Catch	%	Catch	%
1975	1.8	.1	256.7	8.1	630.7	19.8	313.4	9.8
1976	1845.3	14.8	1995.2	16.0	4207.9	33.7	418.6	3.3
1977	182.9	2.3	1112.8	13.9	2733.7	34.3	932.3	11.7
1978	2307.7	13.6	4485.7	26.5	3892.6	23.0	676.6	4.0
1979	46.6	.4	2021.9	16.3	4406.9	35.5	731.7	5.9
1980	3527.7	18.4	2331.8	12.2	2386.1	12.5	721.5	3.8
1981	228.0	1.7	2438.3	19.1	2531.8	19.3	1120.9	8.6
1982	2617.8	24.0	1125.6	10.3	1255.5	11.5	1182.8	10.9
1983	53.1	.7	2025.5	28.6	1479.7	20.9	900.7	12.7
Average Percentage of Total Catch		8.4		16.8		23.4		7.9

[1] Percentage of total Kodiak Management Area salmon catch.

SOURCE: Kodiak Area Finfish Management Reports

FIGURE 2
KODIAK MANAGEMENT AREA HERRING DISTRICTS


156°
154°
152°
58°
58°
map location
25
0
25
50 mi.
BARREN ISLANDS
Cape Douglas
AFOGNAK
SHUYAK ISLAND
AFOGNAK ISLAND
MARMOT STRAIT
MARMOT ISLAND
RASPBERRY STRAIT
Cape Raspberry
Marmot Bay
MARMOT FLATS
Kukak Bay
SHELIKOF STRAIT
MAINLAND
UGANIK
Uganik Bay
Kizhuyak Bay
Buskin River
Chiniak Bay
Cape Chiniak
KODIAK ISLAND
UYAK
Uyak Bay
Puale Bay
Cape Karluk
GENERAL
Ugak Bay
Cape Igvak
STURGEON/ HALIBUT
Wide Bay
Karluk Lake
Red Lake
Red R.
Cape Ikolik
Frazer Lake
Kiliuda Bay
Olga Bay
MAINLAND
SITKALIDAK ISLAND
TWOHEADED ISLAND
Alitak Bay
Cape Trinity
ALITAK
Cape Kumlik
SUTWIK ISLAND
ALBATROSS BANK
TRINITY ISLANDS

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that have recently sustained commercial use. Other estimates of stock abundance and trends are based on cohort analysis of the age composition of the stocks. Estimates of biomass abundance and recent harvest levels are reported in Table 4. Both biomass and appearance of young herring in the fishery are increasing, indicating growth in Kodiak herring stocks in most areas (ADF&G 1985a:459).

TABLE 4

KODIAK AREA HERRING BIOMASS ESTIMATES
AND HARVEST GUIDELINES (SAC ROE AND FOOD/BAIT COMBINED), 1975-1984

Year	Biomass Estimate (Metric tons)	Harvest Guidelines (Metric tons)
1975	No survey	12
1976	No survey	12
1977	No survey	12
1978	No survey	1,182
1979	No survey	1,688
1980	No survey	2,508
1981	6,720	1,889
1982	5,768	1,620
1983	6,910	2,138

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SOURCE: ADFG 1984a, 1984b, 1985a, 1985b

Herring are harvested for sac roe, food, and bait. The sac roe fishery is usually from mid-April to early June. Purse seine and gillnet are used in the bays; no special areas are designated for these gear types. Table 5 presents sac roe harvests by district from 1977 to 1984. The resource is fairly evenly distributed; however the Afognak and General districts had the highest average production over the period. Bait harvests are taken predominantly by gillnets prior to the opening of crab and halibut seasons. A food fishery began again in the fall and winter of 1982-83 using purse seines.

Halibut. The Kodiak area is extremely attractive habitat for Pacific halibut (Hippoglossus stenolepis). The highest concentration of halibut in the Gulf of Alaska are found in the Kodiak area. The annual cycle of adult halibut includes wintering in deep water (up to 1097 meters) along the edge of the continental shelf followed by movement to shallower banks and coastal waters during the summer. Spawning occurs from November to March in deeper waters; eggs, larvae, and postlarvae are free-floating organisms which are transported long distances, often at substantial depths, throughout the North Pacific. Major spawning sites in the Kodiak area include the Chiniak and Kiliuda troughs on the east side of Kodiak Island, south of the Trinity Islands, and west of Chirikof Island (ADF&G 1985a:406). Males mature at approximately age eight in the Gulf of Alaska while average age at maturity for females is 12 (ADF&G 1985a:404).

TABLE 5

KODIAK MANAGEMENT AREA HERRING SAC ROE HARVESTS BY DISTRICT, 1977-1984
(Metric Tons)

	Number (Stock Units)	1977	1978	1979	1980	1981	1982	1983	1984	Average
Afognak	9	0	15.7	383.9	719.5	270.2	349.8	418.6	544.3	453
Uganik Bay	3	0	119.3	265.1	190.7	372.1	260.2	237.6	270.4	261
Uyak Bay	4	195.9	432.5	302.2	227.6	233.3	267.7	439.9	378.8	320
General	8	102.0	59.0	397.4	490.9	251.0	445.1	634.3	493.7	431
Alitak Bay	3	0	0	298.1	244.9	461.0	203.2	291.8	274.2	315
Sturgeon River	1	0	0	0	0	0	0	0	0	0
Mainland	7	40.5	0	89.0	510.7	475.8	244.6	296.3	261.3	391
Remainder of Management Area	6	0	0	0	0	0	0	0	0	0
Totals	41	338.4	626.5	1735.7	2384.3	2063.4	1770.6	2318.5	2167.7	2171

SOURCE: ADFG 1984d

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Halibut are distinctive as a species in that they are biologically managed by the International Pacific Halibut Commission (IPHC), a treaty-based commission jointly composed of United States and Canadian members. Since 1982, the North Pacific Fishery Management Council (NPFMC), the federal body responsible for management of the economic zone from 3 to 200-miles off the coast, has the authority to set seasons, gear, and other regulations to manage the fishery. The IPHC continues to collect harvest information, restricts gear and the size of fish landed, conducts research, and sets annual quota levels based on biological evidence.

The IPHC divides the north Pacific into regulatory and statistical areas. Regulatory areas are large geographic units used for setting quota levels and season levels. They are based on stock separation studies which have determined that stocks south of Cape Spencer are distinct from stocks of the Gulf of Alaska and Bering Sea west of Cape Spencer (Bell 1981:216). There are presently three regulatory areas (Nos. 2, 3 and 4) with several subdivisions. Regulatory area 3 includes all waters north and west of Cape Spencer (in northern southeast Alaska) to Cape Lutke on Unimak Island in the Aleutian Islands. Area 3 is further subdivided into areas 3A (from Cape Spencer to Cape Trinity), and area 3B (from Cape Trinity to Cape Lutke on Unimak Island). Statistical areas were established by the IPHC in the 1920s for reporting purposes. Except in the western Aleutian Islands and in the Bering Sea, statistical areas are divisions of a base line following the contour of the coast of North America made by extending perpendicular lines to the base line at 60-mile intervals. In the Kodiak area, the statistical areas which approximate the Kodiak Management Area are 27, 28, and 29, each of which is subdivided into two sub-areas--270-271, 280-281, and 290-291, respectively (see Figure 3).

Total harvests taken from these three statistical areas from 1970 to 1983 are reported in Table 6. The halibut resource fell to its lowest historic level of abundance throughout the North Pacific in 1974, but by 1982 stocks had finally rebounded as restrained seasons and harvest levels designed to rebuild the stock began to show dividends. The quota of 32 million pounds established by the IPHC for area 3 in 1985 indicates that the resource is robust.

Commercial landings are not the only human harvests of halibut. Incidental harvests of halibut are also taken by foreign trawlers, foreign setliners, and joint venture operations in which American fishermen deliver catches to foreign processing vessels. In 1983 the estimated incidental catch of halibut amounted to 9.8 million pounds for the entire North Pacific (IPHC 1985). Of that amount 41 percent was taken by foreign trawlers, 46 percent by foreign setliners, and 13 percent by joint venture operations. Additional halibut harvested but not accounted for are taken by domestic trawlers, domestic pot fishermen, and a substantial and growing sport/personal use fishery.

TABLE 6

KODIAK AREA HALIBUT CATCH, 1970-1983
(Statistical Areas 27,28,29)
(Thousands of Pounds)

Year	Statistical Area 27 (270 & 271)	28 (280 & 281)	29 (290 & 291)	Total
1970	1959	2731	3307	7997
1971	1680	1771	2713	6164
1972	1832	2384	3324	7540
1973	2219	1728	1836	5783
1974	930	730	713	2373
1975	1014	719	915	2648
1976	1247	1136	1149	3532
1977	886	912	1133	2931
1978	12	949	961	1922
1979	5	532	537	1074
1980	480	352	88	920
1981	1238	692	333	2263
1982	1684	1222	2052	4958
1983	2240	1917	4129	8286
Average	1309	1394	1897	4600

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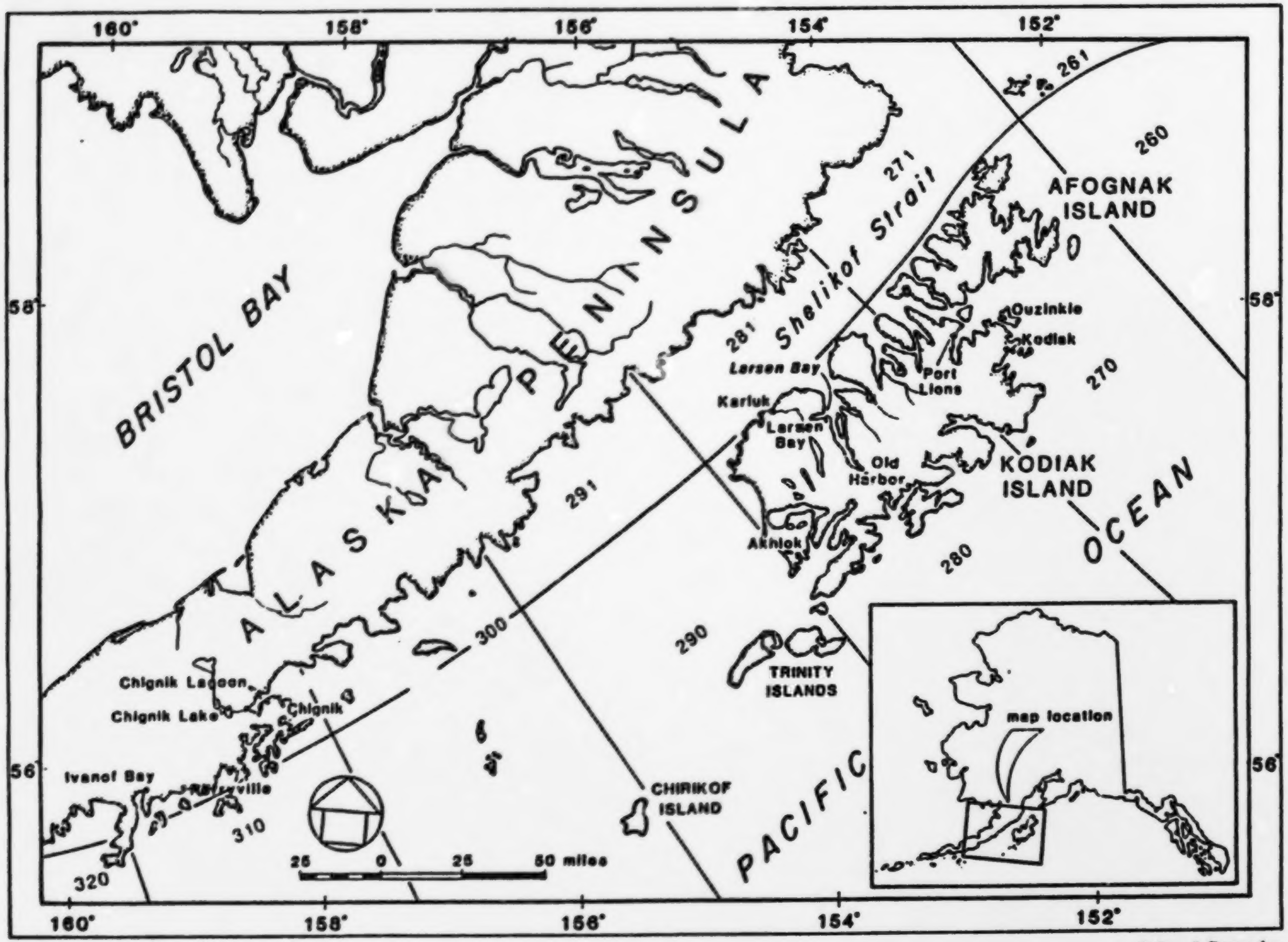
SOURCE: IPHC 1977 and personal communication (1985)

FIGURE 3
KODIAK AREA IPHC STATISTICAL AREAS


160°
158°
156°
154°
152°
58°
56°
BRISTOL BAY
ALASKA PENINSULA
Shelikof Strait
AFOGNAK ISLAND
KODIAK ISLAND
PACIFIC OCEAN
TRINITY ISLANDS
CHIRIKOF ISLAND
Ouzinkie
Kodiak
Port Lions
Larsen Bay
Karluk
Old Harbor
Akhiok
Chignik Lagoon
Chignik Lake
Chignik
Ivanof Bay
Perryville
261
260
271
270
281
280
291
290
300
310
320
25 0 25 50 miles
map location

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Groundfish. The term groundfish (or bottomfish) is commonly used to refer to a complex of stocks which occupy the ocean bottom, for the most part, and which are harvested primarily by trawling. These stocks are found in state and federal waters and so fall under separate jurisdictions. The majority of the harvest, however, occurs outside of three miles. Consequently federal management by the North Pacific Fishery Management Council and the National Marine Fisheries Service is more developed than that of the State of Alaska. For the study period, 1975-1983, extensive data are not easily retrieved. From what could be obtained a brief description of the most commercially significant species, recent indicators of abundance where available and recent harvest figures are provided.

Groundfish stocks are managed for the entire Gulf of Alaska by the NPFMC under a plan drafted by the Council and approved by the Secretary of Commerce in December 1978. The plan categorizes species into different classes for which different management procedures are authorized. *Target* species are defined as those which are commercially important and for which sufficient data exist to specify optimum yield. Target species include:

Pollock (*Theragra chalcogramma*)
Sablefish (*Anaplopoma fimbria*)
Pacific Ocean perch (*Sebastes alutus*, *polyspinus*, *aleutianus*, *borealis*, *zacentrus*)
Thornyhead rockfish (*Sebastolobus alascanus* and *altivelis*)
Other rockfish (*Sebastes* species other than above)
Pacific cod (*Gadus macrocephalus*)
Atka mackerel (*Pleurogrammus monopterygius*)
Flatfish (several species--see below)
Squid (*Berryteuthis magister*, *Berryteuthis anononychus* and *Gonatus* spp.)

A secondary category of species termed *other* is defined as having little economic value but either are significant components of the ecosystem or have economic potential. Species identified as other include:

Eulachon
Smelt
Capelin
Skates
Sharks
Sculpin
Octopus

A number of other fish species that occur in waters of the Kodiak and Chignik regions are not addressed in management policies but are termed *non-specified*. The designation may come from lack of abundance, lack of information, or lack of economic value.

Data on Gulf of Alaska groundfish species come from a variety of sources including foreign fishing vessels, U.S. fishing vessels, joint venture fishing operations, Japanese research vessels, and U.S. research vessels. Because of the longstanding foreign, particularly Japanese, harvests of Gulf of Alaska groundfish, the primary organization for the collection of data has been the International North Pacific Fishery Commission (INPFC), a three party treaty-based commission consisting of the United States, Canada, and Japan. The INPFC established a series of reporting areas in the early 1950s which have subsequently been used for the organization of groundfish data. INPFC regions for the Gulf of Alaska are Southeastern, Yakutat, Kodiak, Chirikof, Shumagin, and Aleutian. The two areas which encompass waters normally considered part of the Kodiak management area are the Kodiak region, which extends from 147 west longitude (central Prince William Sound) to 154 west longitude (Cape Trinity at the southwest end of Kodiak Island), and the Chirikof region, which extends from 154 west longitude to 159 west longitude (Cape Trinity to Kupreanof Point, the southwestern boundary of the ADF&G Chignik Management Area). These two areas are combined in NPFMC management measures into the Central regulatory area (see Figure 4). Kodiak Area Annual Finfish Management Reports include groundfish landings from the Kodiak ADF&G management area which are derived from figures for the Kodiak INPFC region.

Pollock are at present the most abundant fishery resource in the study area. Their abundance came from rapid growth between 1976 and 1980 with the appearance of five consecutive strong year classes (Alton and Rose 1984:17). The Gulf of Alaska stock is considered a single stock separate from those of the Bering Sea and Aleutian Islands. The annual cycle for pollock appears to involve concentration for spawning in the southern Shelikof Strait region from January through April, followed by dispersal both westward and eastward. Stocks at the present time are depressed because of below average recruitment. The maximum sustained yield of the pollock in the central and western Gulf of Alaska is estimated to be between 166,200 and 334,000 metric tons (NPFMC 1985).

Table 7 presents 1974 to 1983 data on harvests of pollock by domestic, joint venture, and foreign fishermen in three Gulf of Alaska INPFC areas and the total Gulf of Alaska. Gulfwide harvests increased from 10,433 metric in 1977 to 215,601 metric tons in 1983. The shifting location of the largest harvest between the three areas reflects the location of the concentration of the spawning biomass in the first quarter of the year. During the study period the spawning biomass was increasingly concentrated in the Chirikof area at the southern end of Shelikof Strait.

Sablefish have become important to domestic fishermen seeking new resources to replace the king crab. Rapid entry into this fishery has led to shortened seasons, steps to limit participation, and elimination of pot gear. A number of uncertainties exist about the biology of sablefish including questions of stock structure and migration. One model (Bracken 1982) postulates a single Gulfwide stock with spawning grounds off southeast Alaska; this model suggests migration of immatures westward to the Kodiak-Chirikof areas and beyond where they mature and then return, migrating eastward for spawning at maturity. The other model posits a number of overlapping but essentially distinct stocks which can be managed more or less independently on a regional basis.

Sablefish are found during most of the year on the edge of the continental shelf, but can be found as deep as 1200 meters. Young sablefish are generally found in shallower waters from 70 to 200 meters. The highest

FIGURE 4
GULF OF ALASKA INPFC STATISTICAL AREAS
(Shumagin, Chirikof, Kodiak, Yakutat, Southeastern)
AND NPFMC REGULATORY AREAS
(Western, Central, Eastern)

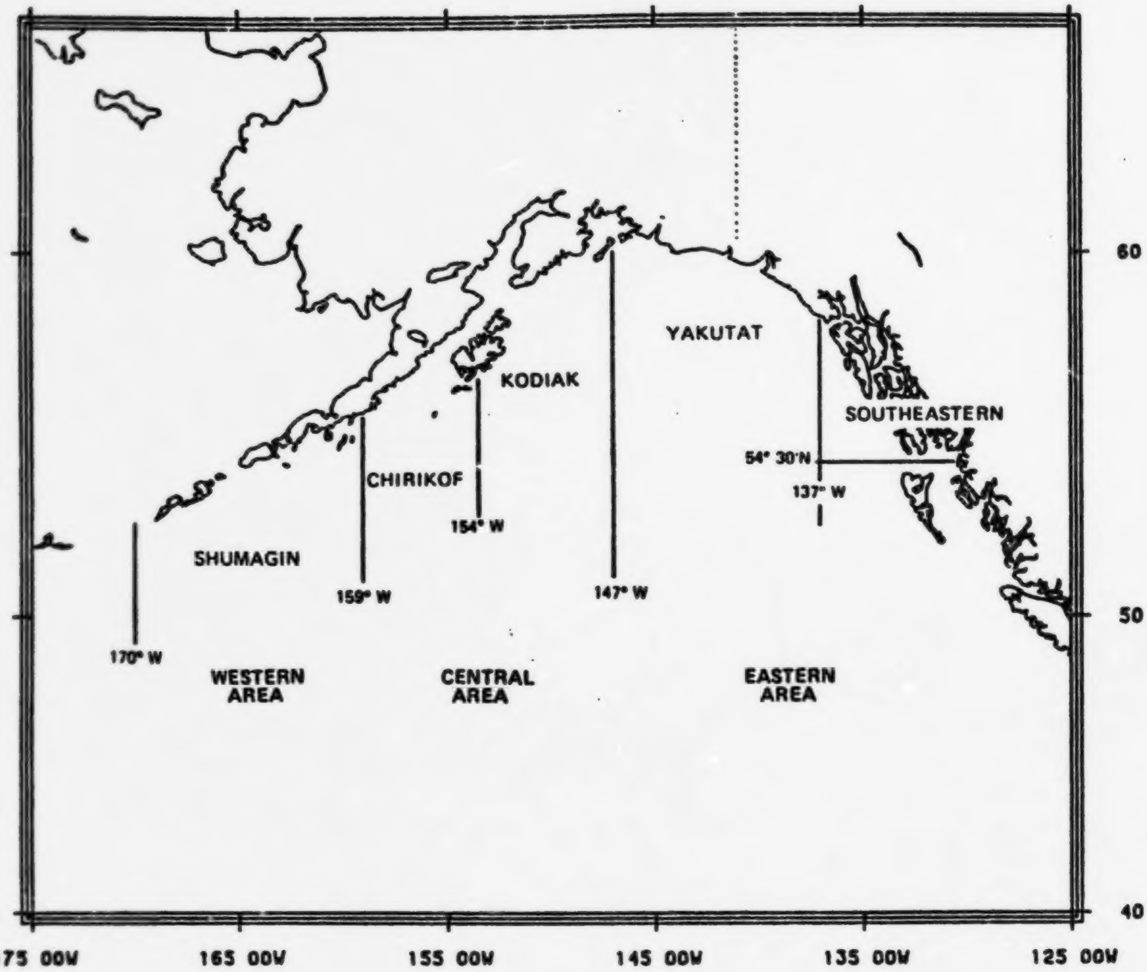
YAKUTAT
KODIAK
SOUTHEASTERN
54° 30'N
137° W
CHIRIKOF
154° W
SHUMAGIN
159° W
147° W
170° W
WESTERN AREA
CENTRAL AREA
EASTERN AREA
60 00N
50 00N
40 00N
175 00W
165 00W
155 00W
145 00W
135 00W
125 00W

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TABLE 7

GULF OF ALASKA POLLOCK HARVESTS BY INPFC AREAS, 1974-1983
(Metric Tons)

	Shumagin		Chirikof		Kodiak		
Year	Catch	% of Total	Catch	% of Total	Catch	% of Total	Total
1974	10486.3	17	8650.3	14	38379.8	62	61444.4
1975	1325.0	10	5450.0	41	5608.0	42	13436.0
1976	618.0	5	6056.0	51	4568.0	38	11980.8
1977	910.0	9	1780.0	17	4762.7	46	10432.8
1978	32928.3	33	42989.1	44	18373.8	19	98824.1
1979	29612.9	28	29262.7	28	40188.7	38	104670.3
1980	44499.0	40	35399.1	32	27035.9	24	111731.1
1981	46212.9	32	82250.8	56	9594.6	7	146658.7
1982	34236.3	21	113247.2	71	13010.4	8	160545.7
1983	39817.8	18	159912.0	74	15830.7	7	215601.7

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SOURCE: NPFMC

densities in the Kodiak and Chirikof areas were in the 200-400 meter range. A diurnal vertical migration is characteristic of the species as they move from surface waters in the day to bottom waters at night. Sablefish are known from tagging studies to have migrated long distances (up to 185 kilometers), but most do not migrate over 50 kilometers from the point of tagging (Wespestad 1981). Feeding occurs both near the surface and in bottom water layers. Spawning normally occurs in waters from 250 to 750 meters deep from January through April with peak spawning in February.

Two-thirds of the North Pacific and Bering Sea stocks of sablefish are found in the Gulf of Alaska. The maximum sustained yield for the Gulf of Alaska resource has been estimated at 25,100 metric tons (ADF&G 1985a:429). Stock abundance at present is considered only fair, but some indices suggest that restricted harvest levels since 1978 are beginning to have a positive effect on rebuilding. The historic high in harvest level occurred in 1972 when over 30,000 metric tons were harvested, with over 90% of the harvest being taken by Japanese longline fishermen. Table 8 presents data on total harvests by INPFC area since 1977. The distribution of catch between the three areas remained fairly constant after 1980.

Pacific Cod are second only to pollock in abundance and harvest quantities in the Gulf of Alaska. The greatest abundance occurs in the Kodiak and Sanak Island areas of the Gulf. Present information on distinct cod stocks is limited. The species is relatively short-lived and fast growing. The annual cycle of the cod in the Gulf of Alaska involves movement into deep water (110-130 meters) for spawning in late winter, generally between

TABLE 8

GULF OF ALASKA SABLEFISH HARVESTS BY INPFC AREA, 1977-1983
(Metric Tons)

	Shumagin		Chirikof		Kodiak		
Year	Catch	% of Total	Catch	% of Total	Catch	% of Total	Total
1977	1864	11	1548	9	3588	21	17130
1978	1611	18	1028	12	2254	25	8904
1979	999	10	1109	11	2123	21	10194
1980	1451	17	1362	16	1679	20	8408
1981	1567	16	1646	17	1788	21	9774
1982	1489	17	1377	16	1568	18	8653
1983	1498	17	1305	14	1518	17	9061

SOURCES: ADF&G 1985b:35, Stauffer 1984:42

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January and March. In the spring, cod return to shallower waters for feeding. Migratory movements of cod tend to be fairly small, usually less than 50 kilometers. Cod are particularly abundant on the Albatross Bank off the southwest coast of Kodiak Island and in deeper portions of bays along the Alaska Peninsula and around Kodiak Island (ADF&G 1985b:22).

The maximum sustained yield for the Gulf of Alaska Pacific cod stocks is estimated to be 88,000 to 117,000 metric tons (ADF&G 1985a:413). Cod stocks declined in the mid-1970s, but have recently increased in abundance due to the presence of strong 1977 and 1978 year classes. Current harvests of cod are stable but they may decline after 1984 due to the lack of a strong year class since 1977 and 1978. Table 9 presents cod harvest data by from 1977 to 1983 for the Gulf of Alaska. With the exception of 1977 and 1978, the largest quantities have come from the Chirikof area in which the majority of the Albatross Bank falls.

Pacific ocean perch (POP), as noted above, refers to a complex of species including Sebastes alutus and several other species members of the Sebastes genus. Perch are long-lived, slow-growing species which normally do not attain sexual maturity until they are seven years old. Perch have habitat preferences for water depths ranging from 110 to 140 meters as adolescents but move into deeper waters (320 to 370 meters) when sexually mature. They may be found to depths of 420 meters in the winter. Perch are ovoviviparous, releasing their live young between March and June. Perch do not undertake any long migrations, but rather consist of a number of small overlapping stocks (Shippen 1984a). Catch statistics for POP are found in Table 10.

TABLE 9

GULF OF ALASKA PACIFIC COD HARVESTS BY INPFC AREA, 1977-1983
(Metric Tons)

	Shumagin		Chirikof		Kodiak		
Year	Catch	% of Total	Catch	% of Total	Catch	% of Total	Total
1977	626	28	362	16	876	39	2223
1978	5591	46	4707	39	1488	12	12160
1979	3981	27	6541	44	3829	26	14869
1980	8704	25	18627	53	5871	17	35439
1981	11579	32	19114	53	3035	8	36086
1982	7344	25	14361	49	5542	19	29379
1983	9178	25	15676	43	9567	26	36402

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SOURCE: Zenger 1984:81

TABLE 10

GULF OF ALASKA PACIFIC OCEAN PERCH HARVESTS BY INPFC AREA, 1974-1983
(Metric Tons)

	Shumagin		Chirikof		Kodiak		
Year	Catch	% of Total	Catch	% of Total	Catch	% of Total	Total
1974	4082	8.5	3497	7.3	8096	17	47980
1975	4158	9.4	3996	9	10016	23	44131
1976	5896	12.5	3671	7.8	8907	19	46968
1977	2663	12	3125	14.4	5565	26	21637
1978	3643	45	735	9	1287	16	8171
1979	944	10	259	3	2112	22	9749
1980	842	7	656	5	3333	27	12447
1981	1234	10	2370	19.5	1898	16	12177
1982	1746	22	3499	44	2724	34	7988
1983	672	12.4	2510	46	2216	41	5416

Cultural Dynamics 1986

SOURCE: Shippen 1984a:128-29

In the 1960s, s. alutus was one of the most abundant species of Gulf of Alaska groundfish. Maximum sustained yield is estimated to be 125,000 to

150,000 metric tons (NPFMC 1985). Targeted trawl fisheries by Japanese and Russian vessels in the mid-1960s, which peaked at 348,598 metric tons in 1965, depleted the resource. Perch stocks are now thought to be no more than 5 percent of their virgin abundance (Ito 1982). It is thought that perch and pollock are trophic competitors and that the recent success of pollock is at least partly the result of the decline of perch (ADF&G 1985a:422).

Atka mackerel, like Pacific Ocean perch, is a species which was previously quite abundant in the Gulf of Alaska but has been seriously depleted primarily from overharvesting by Japanese and Russian trawlers in the mid-1970s. There is, however, little biological information on the nature of the species. It is known to be concentrated in the Shumagin, Kodiak, and Chirikof regions with little found east of 148 west longitude. Atka mackerel occur primarily on the Albatross and Portlock Banks in the Kodiak and Chirikof regions. Catch statistics are found in Table 11.

TABLE 11

GULF OF ALASKA ATKA MACKEREL HARVESTS
BY INPFC AREA, 1974-1983
(Metric Tons)

	Shumagin		Chirikof		Kodiak		
Year	Catch	% of Total	Catch	% of Total	Catch	% of Total	Total
1974	4742	27	2748	16	10041	57	17531
1975	2132	8	743	3	23688	85	27776
1976	-	-	-	-	19721	98	20032
1977	69	-	2056	11	17120	89	19245
1978	488	2	17587	90	1221	6	19586
1979	419	4	720	7	9800	89	10950
1980	1718	13	278	2	10995	83	13162
1981	3471	19	12537	67	1415	8	18727
1982	3163	47	3508	52	87	1	6759
1983	2594	23	8811	77	65	1	11470

Cultural Dynamics 1986

SOURCE: Ronholt 1984:106

The maximum sustained yield is estimated to be between 7,800 and 26,800 metric tons (NPFMC 1985). Stocks are presently greatly reduced and no directed fishing on Atka mackerel will be allowed in the Central area until stocks have rebuilt.

Flounders, as the category is used by the NPFMC for management, consists of the following major species which together constituted 95 percent of the flounder harvest in 1983:

Arrowtooth flounder (Atheresthes stomias)
Flathead sole (Hippoglossoides elassodon)
Rock sole (Lepidopsetta bilineata)
Rex sole (Glyptocephalus zachirus)
Dover sole (Microstomus pacificus)

In addition, the following minor species are also included in the category for management convenience:

Greenland turbot (Reinhardtius hippoglossoides)
Butter sole (Isopsetta isolepis)
Starry flounder (Platichthys stellatus)
Yellowfin sole (Limanda aspera)

The maximum sustained yield for the flounder complex has been estimated to be 67,000 metric tons (Rose 1984:172). Stocks have only been lightly exploited because they have not been targeted, but several species in the complex are highly valued and greater interest in them has been expressed by joint venture fishermen (Rose 1984:172). Table 12 presents harvest data for the five species comprising the vast majority of the flounders catch.

Other species for which explicit management harvest levels are set are thornyhead rockfish, sebastes species not in the Pacific Ocean perch complex (termed other rockfish) and squid. The maximum sustained yield of thornyheads is set at 3750 metric tons for the entire Gulf. Although some interest has been shown in these fish, they are being harvested below optimum levels (Shippen 1984b). Squid appear to have a high biomass and have only come under exploitation by foreign fishermen in recent years; the maximum sustained yield for squid is 5,000 metric tons (NPFMC 1985). The other rockfish, however, are considered to be depressed. A re-evaluation of the nature of these stocks will likely result in lowering the maximum sustained yield range below the 7600-metric ton level.

Shellfish

We now turn to a discussion of shellfish in the Kodiak area including king crab, tanner crab, dungeness crab, shrimp, and several miscellaneous species. The Kodiak king crab registration area/district of the western region extends from Cape Douglas to Cape Kumlik on the Alaska Peninsula and includes all the waters of the Kodiak archipelago. The area is subdivided into five districts: Northeast (Stock I), Southeast (Stock II), Southwest (Stock III), Shelikof, and Semidi Island (see Figure 5). A complex set of five-digit statistical areas constructed on the basis of ocean depth and floor type were used for crab reporting purposes up until 1984 when a new statistical area system was introduced. In addition, a new organization of crab populations into stocks was also established in 1983 (see Figure 6).

King crab was the species whose development initiated and underwrote the emergence of Kodiak as a major fishing port in the United States. Commercial harvests of the species have been recorded since 1950. The primary species covered by the label king crab is Paralithodes camtschatica or red king crab. Also available in the deeper waters (below 100 fathoms) of the Gulf of Alaska is Lithodes aquispina, the brown or golden king crab, and, in a few isolated locations, Paralithodes platypus or blue king crab.

TABLE 12

GULF OF ALASKA FLOUNDER HARVESTS BY SPECIES AND INPFC AREA, 1978-1983 (Metric Tons)

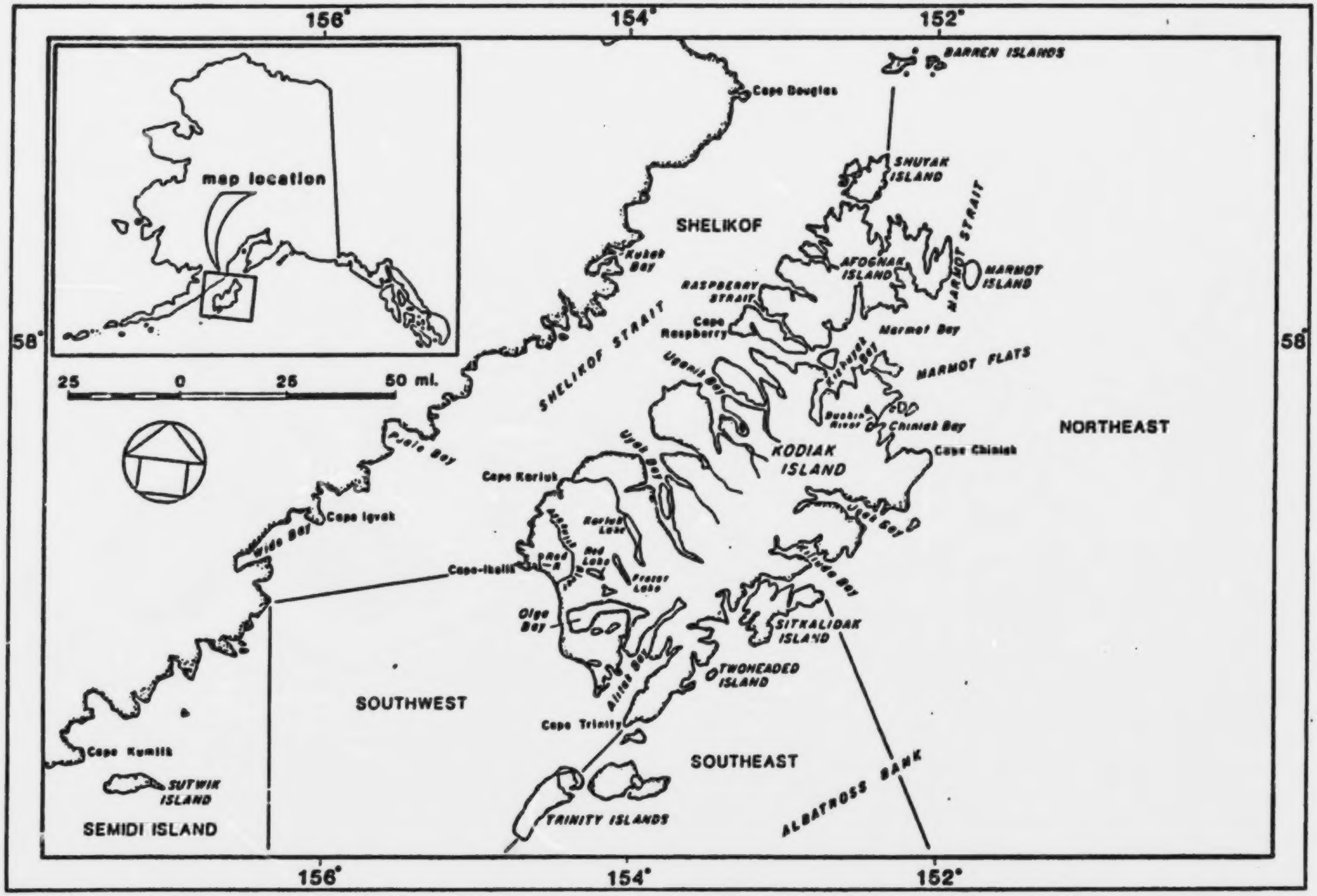
Species	Shumagin		Chirikof		Kodiak		Total
Year	Catch	% of Total	Catch	% of Total	Catch	% of Total	
Arrowtooth flounder							
1978-81*	2237	19	1529	13	3086	26	11969
1982	1068	18	2606	44	2284	38	5962
1983	1579	17	3911	42	3710	40	9244
Rock sole							
1978-81	295	71	54	13	56	13	414
1982	195	47	23	8	80	27	298
1983	323	31	13	1	698	67	1034
Flathead sole							
1978-81	43	9	184	37	165	33	495
1982	63	5	108	9	1025	83	1236
1983	63	11	79	14	434	75	576
Rex sole							
1978-81	101	13	117	15	416	53	778
1982	36	4	105	11	818	85	959
1983	93	16	96	16	406	68	595
Dover sole							
1978-81	48	8	53	9	357	60	596
1982	50	11	56	12	364	80	456
1983	39	11	112	32	196	55	354

SOURCE: Rose 1984:170

* Average of catches 1978-81

Cultural Dynamics 1986

The annual cycle for crabs includes the distinctive molting or shedding of shells on an annual basis. This normally occurs during the mating season from February through May when the crabs are in shallow water of 50 fathoms or less. In the Kodiak area, the preferred areas are only from 3 to 8 fathoms (ADF&G 1985a:480). During the spring and summer following molting and breeding, red king crab stay in shallower waters (less than 50 fathoms) for intensive feeding. During the late summer and fall, red king crab are found in depths up to 200 fathoms. In November they begin moving inshore for molting and breeding.


156°
154°
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BARREN ISLANDS
Cape Douglas
SHUYAK ISLAND
SHELIKOF
AFOGNAK ISLAND
MARMOT STRAIT
MARMOT ISLAND
Kukak Bay
RASPBERRY STRAIT
Cape Raspberry
Marmot Bay
MARMOT FLATS
SHELIKOF STRAIT
Uganik Bay
Kizhuyak Bay
Buskin River
Chiniak Bay
Cape Chiniak
NORTHEAST
Puale Bay
KODIAK ISLAND
Uyak Bay
Cape Karluk
Cape Igvak
Wide Bay
Ugak Bay
Karluk Lake
Red River
Red Lake
Cape Ikolik
Fraser Lake
Kiliuda Bay
Olga Bay
SITKALIDAK ISLAND
TWOHEADED ISLAND
Alitak Bay
SOUTHWEST
Cape Trinity
SOUTHEAST
Cape Kumlik
SUTWIK ISLAND
ALBATROSS BANK
SEMIDI ISLAND
TRINITY ISLANDS
156°
154°
152°

Cultural Dynamics

FIGURE 5

KODIAK DISTRICT KING CRAB DISTRICTS

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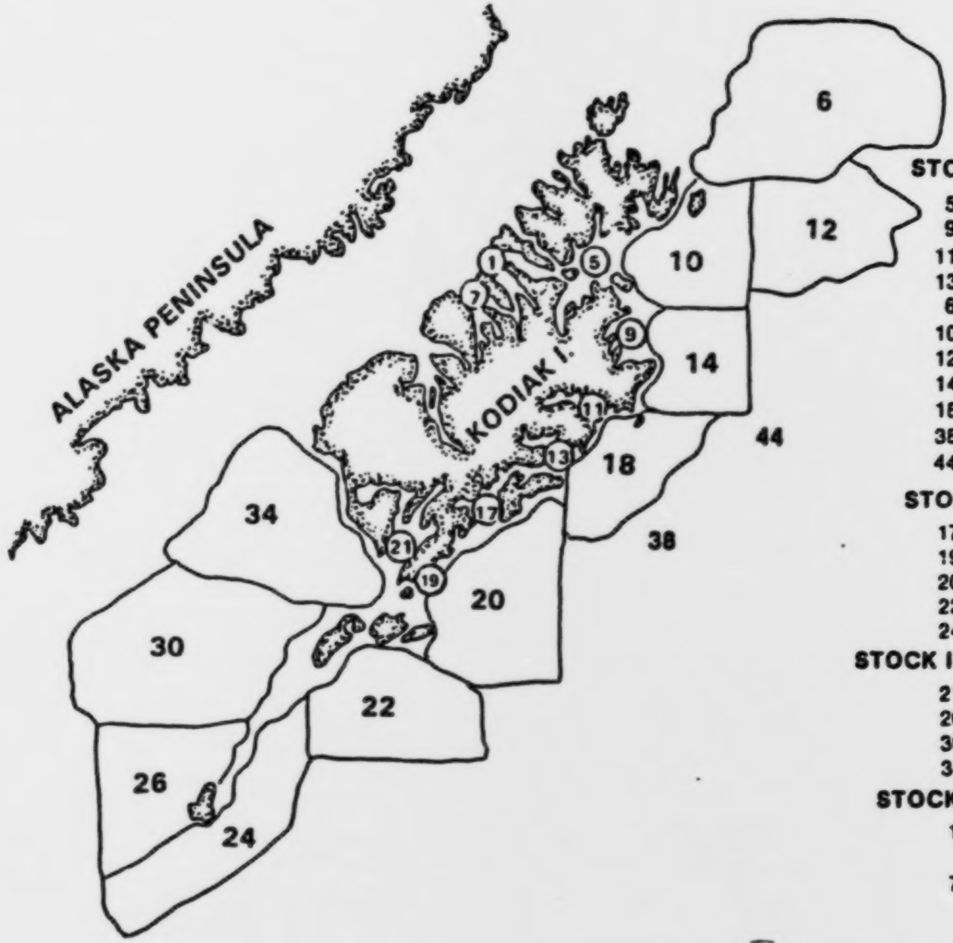
FIGURE 6
KODIAK DISTRICT KING CRAB STOCKS


ALASKA PENINSULA
KODIAK I.
1
5
7
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44

STOCK I — NORTHEAST DISTRICT

5	MARMOT - KIZHUYAK BAY
9	CHINIAK BAY
11	UGAK BAY
13	KILIUDA BAY
6	PORTLOCK
10	INNER MARMOT GULLY
12	OUTER MARMOT GULLY
14	CHINIAK GULLY
18	BARNABAS
38	OFFSHORE BARNABAS
44	OFFSHORE CHINIAK GULLY

STOCK II — SOUTHEAST DISTRICT

17	SOUTH SITKALIDAK BAY
19	INNER HORSE'S HEAD
20	HORSE'S HEAD
22	TOWERS
24	EAST CHIRIKOF ISLAND

STOCK III — SOUTHWEST DISTRICT STOCKS

21	ALITAK BAY
26	WEST CHIRIKOF ISLAND
30	COMPASS ROSE
34	IKOLIK-LOW CAPE

STOCKS IV - VI — SHELIKOF DISTRICT

1	KUPREANOF- VIEKODA BAY
7	UGANIK BAY

Source: ADF & G

Cultural Dynamics 1986

Red king crab become sexually mature at age five and can live to be 15 or 20 years old. It is difficult to determine the age of male crabs after reaching sexual maturity because of periodic and unpredictable skipping of molting. Males tend to be larger than females and they are separated on the grounds except during mating season.

In the Kodiak area, distinct stocks of king crab have been delineated with minimal mixing between stocks (ADF&G 1985a:486). Major producing stocks occur in the Northeast, Southeast and Southwest districts. Inshore and nearshore areas are most critical for king crab spawning; important offshore areas include Portlock Bank, Marmot Flats, Alitak Flats, and the Albatross Banks. The shallow region surrounding Chirikof Island north to the Trinity Islands is significant for both the spawning and rearing of red king crabs, particularly at present when stocks in this area are relatively healthy compared to other Kodiak area stocks (Lechner 1985). Blue king crabs occur regularly only in Olga Bay (ADF&G 1985a:486). Limited numbers of brown king crab are found in the deeper waters below 100 fathoms in the Kodiak area.

The maximum sustained yield for king crab in the Kodiak area was estimated to be 50 million pounds (ADF&G 1985b:111). Average commercial landings from 1960 to 1983 amounted to almost 27 million pounds. Abundance estimates for Kodiak red king crab from 1974 to 1981 averaged nearly 30 million pounds of legal male red crabs with a peak of 53.8 million pounds in 1979. In 1982, however, population fell to 12 million pounds and in 1983 fell drastically to 1.4 million pounds. The sudden nature of the king crab collapse is made clearer when it is noted that the number of crabs caught per pot in stock assessment surveys dropped from 27.7 in 1981 to 4.2 in 1982 (ADF&G 1985a:487). A number of theories have been proposed to account for the decline including predation, disease, warm water, handling stress and parasites. No commercial fishery on red king crabs was allowed in 1983 or 1984 and, with the possible exception of Semidi Island district, none is expected in 1985.

Table 13 summarizes commercial harvest data from 1960 to 1984. Peak harvest was obtained in 1965-66 when over 94 million pounds of king crab were taken from Kodiak area waters. Since 1970, however, more than 25 million pounds has never been taken in any year. Throughout the 1970s, the Southwest stock was the most productive, followed in order by the Northeast and Southeast stocks.

The decline of red king crab has led to exploitation of the less accessible brown king crab stocks. In 1983, 12 vessels landed 111,398 pounds of brown king crab of which 64,819 came from the Shelikof district; 29,996 from the Semidi district; 8,360 pounds from the Southeast district; and 5,122 pounds from the Southwest district (ADF&G 1984:34). The brown king crab stock appears to be small and unlikely to support a harvest in excess of 150,000 pounds. Even at the low levels of harvesting experienced to date, biologists are concerned because of barren females and parasites that have been detected on some brown king crab.

TABLE 13

KODIAK DISTRICT KING CRAB HARVESTS BY STOCK (DISTRICT) 1960-1984

Fishing Year	Stock I		Stock II		Stock III		Other Stocks		Totals	
	No.	Lbs.	No.	Lbs.	No.	Lbs.	No.	Lbs.	No.	Lbs.
1960-1961	269,429	2,499,909	658,120	7,405,755	837,216	7,815,131	351,610	3,344,076	2,116,375	21,064,871
1961-1962	498,344	4,580,779	869,707	8,735,268	1,148,059	9,358,636	665,444	6,288,217	3,181,554	28,962,900
1962-1963	1,037,540	10,257,992	1,267,138	12,136,629	1,393,632	11,010,718	447,833	4,221,364	4,146,143	37,626,703
1963-1964	1,666,875	16,479,593	1,362,566	12,295,969	712,034	5,605,489	417,513	3,335,172	4,158,988	37,716,223
1964-1965	1,374,436	13,570,658	2,755,000	21,763,800	449,851	3,461,206	344,022	2,800,854	4,923,309	41,596,518
1965-1966	2,339,423	22,966,614	6,995,595	57,643,489	1,504,577	12,036,222	222,124	1,784,701	11,061,709	94,431,026
1966-1967	1,541,723	15,716,564	4,645,057	39,215,389	1,919,636	15,562,870	369,883	3,322,956	8,476,299	73,817,779
1967-1968	987,324	9,540,196	1,080,565	8,387,022	2,596,691	21,121,856	482,741	4,399,418	5,147,321	43,448,492
1968-1969	546,995	4,714,838	652,627	4,730,183	807,360	6,109,150	341,968	2,657,314	2,348,950	18,211,485
1969-1970	400,245	3,246,190	430,846	3,152,575	410,620	3,157,224	364,470	2,644,582	1,606,181	12,200,571
1970-1971	374,933	3,142,881	606,948	4,216,123	284,104	1,998,344	295,333	2,370,462	1,561,318	11,727,810
1971-1972	78,698	658,749	656,082	4,579,149	736,298	5,128,154	68,079	525,086	1,539,157	10,891,138
1972-1973	128,120	1,039,847	871,238	6,600,988	906,794	6,844,092	122,168	994,989	2,028,320	15,479,916
1973-1974	202,178	1,648,990	1,009,625	7,896,548	543,451	4,092,729	92,425	759,020	1,847,679	14,397,287
1974-1975	570,947	4,665,636	1,008,710	8,374,135	1,168,052	9,303,988	169,047	1,277,961	2,916,756	23,621,720
1975-1976[2]	890,044	7,747,625	631,474	5,018,948	1,230,413	9,501,631	225,478	1,793,447	2,977,409	24,061,651
1976-1977	752,044	6,888,033	578,995	4,516,641	708,522	5,377,321	139,315	1,191,653	2,178,876	17,973,698
1977-1978	289,806	3,012,932	446,728	3,501,170	787,772	6,398,641	66,141	590,923	1,590,447	13,503,666
1978-1979	187,344	1,829,449	245,440	2,011,580	948,069	7,484,847	83,138	695,972	1,463,991	12,021,848
1979-1980	281,873	2,337,450	237,778	1,679,972	1,335,543	9,630,950	124,200	960,528	1,979,394	14,603,900
1980-1981	569,820	4,647,631	506,338	3,616,619	1,448,006	10,203,024	263,035	1,986,380	2,787,199	20,448,654
1981-1982[3]	1,059,048	9,559,327	903,565	6,680,999	861,414	6,410,813	211,647	1,586,462	3,035,674	24,237,601
1982-1983[3]	498,596	4,719,292	243,557	1,966,757	145,648	1,101,944	123,308	941,768	1,011,109	8,729,761
1983-1984	•	•	• SEASON	CLOSED	•	•	•	•	•	•
Totals	16,545,785	155,466,225	28,663,689	236,125,708	22,883,762	178,714,980	5,990,922	50,473,305	74,084,158	620,780,218

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[1] Source of data, ADFAG fish ticket statistics, yearly totals include blue and brown king crab which seldom exceed 40,000 pounds any one year.
[2] In years prior to 1975-76 totals for "other" stocks may omit a small catch of crab from the Kilokak Rocks and Cape Kumlik area of the Alaska Peninsula. King crab deadloss prior to the 1975-76 season was not keypunched or recorded hence poundage is really higher than indicated.
[3] Data is subject to minor change.

2/14/84

SOURCE: ADFG 1984 Western Region Shellfish Report

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Tanner crab (Chionecetes bairdi) is the other major crab species found in Kodiak area. Commercial harvests began on the species in 1967 and peaked in 1977-78 with a total of 33,281,472 pounds landed. Initially harvests were taken primarily from inshore waters but by 1975 offshore areas such as Albatross Bank, Chiniak Gully, Portlock Bank, and the area from Cape Ikolik to Chirikof Island were identified as major producing areas. Most of the pre-1978 harvest was taken by foreign fishermen.

The Kodiak management area for tanner crab corresponds closely at the macrolevel with the Kodiak king crab management area; however, it is subdivided differently into the following districts/sections: Northeast, Eastside, Southeast, Southwest, Westside, South Mainland, North Mainland, and Semidi Island (see Figure 7). Tanner crab stocks identified for management purposes correspond with these districts except that a single Mainland stock is proposed across the North and South Mainland districts. These districts/sections are also used for reporting and managing dungeness crab, scallops and clams. There is no identifiable annual cycle of movement by tanner crab. Although at present not well understood, movements that do occur are neither large nor directional. There is some apparent inshore movement for reproduction. Young, postlarval tanner crab tend to be found in waters closer to shore while older ones are found further offshore. They are rarely found deeper than 450 meters, and major concentrations are restricted to depths less than 300 meters (ADF&G 1985a:498). Molting is characteristic of sexually mature tanner crab and usually occurs for the first time at five or six years of age. Mating typically happens between January and April, followed by hatching of eggs from April to June.

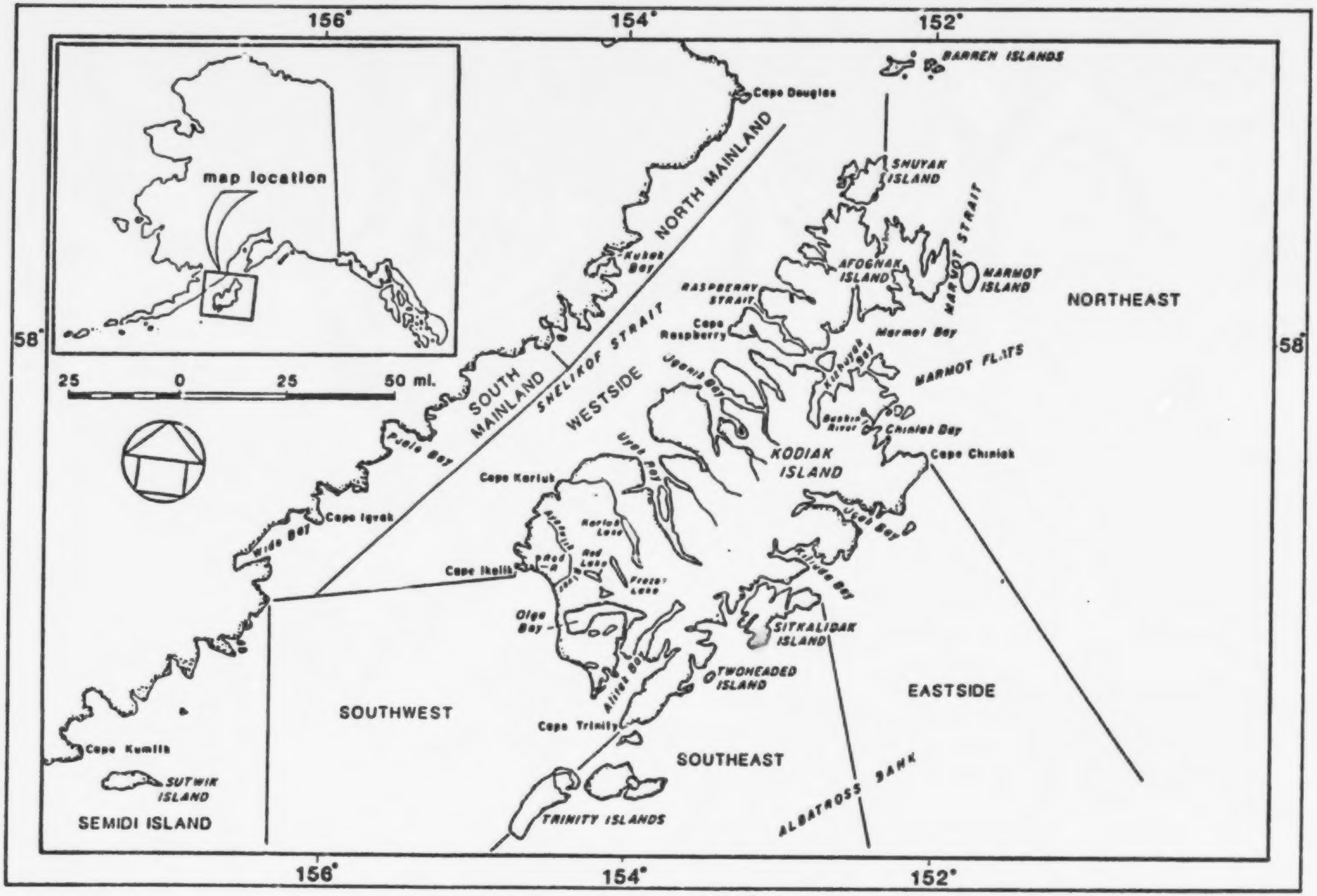
The maximum sustained yield has not been established (ADFG 1985a). Districtwide the resource declined from 1973 to 1981 but has rebounded strongly since that time. The 1985 season was one of the best on record and high catch rates in the stock assessment survey revealed a strong population. Table 14 presents harvest data from the different section from 1972 through 1982. In 7 of the 10 years, the Southwest section dominated by Alitak Bay stocks has been the largest tanner crab producer in the Kodiak area.

Dungeness crab (Cancer magister) has recently emerged as a commercially important species in the Kodiak area because of the decline of king crab. Commercial harvesting of dungeness in the Kodiak area began in 1962 and reached an initial peak of 6.8 million pounds in 1968. Catches declined in the early 1970s due to biological factors and stayed low into the early 1980s with weak market conditions and higher demand for other species. Dungeness crab follow the same annual cycle as most crab species in the Kodiak area, wintering in deeper waters and migrating into shallower water in late winter and spring for spawning and feeding. Dungeness crab are generally found in shallower water than other crab preferring water less than 20 meters deep in the summer and between 20 and 50 meters deep in winter. Molting is characteristic with annual molting by females preceding reproduction and males occasionally skipping molting. Both sexes mature at about three years of age, but are relatively short-lived with few surviving past seven years of age.

FIGURE 7

KODIAK DISTRICT TANNER CRAB SECTIONS

(Also used for dungeness crabs, scallops, and razor clams


156°
154°
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BARREN ISLANDS
Cape Douglas
SHUYAK ISLAND
map location
NORTH MAINLAND
Kukak Bay
AFOGNAK ISLAND
MARMOT STRAIT
MARMOT ISLAND
NORTHEAST
RASPBERRY STRAIT
Cape Raspberry
Marmot Bay
MARMOT FLATS
SHELIKOF STRAIT
SOUTH MAINLAND
WESTSIDE
Uganik Bay
Kizhuyak Bay
Buskin River
Chiniak Bay
Cape Chiniak
KODIAK ISLAND
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Puale Bay
Uyak Bay
Cape Karluk
Karluk Lake
Ugak Bay
Cape Igvak
Wide Bay
Red Lake
Cape Ikolik
Frazer Lake
Kiliuda Bay
Olga Bay
SITKALIDAK ISLAND
TWOHEADED ISLAND
Alitak Bay
EASTSIDE
SOUTHWEST
Cape Trinity
SOUTHEAST
Cape Kumlik
SUTWIK ISLAND
ALBATROSS BANK
TRINITY ISLANDS
SEMIDI ISLAND

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TABLE 14

KODIAK DISTRICT TANNER CRAB HARVESTS BY SECTION 1972-1983

Sections	1973-74[2]	1974-75[2]	1975-76[3]	1976-77[4]	1977-78[5]	1978-79[5]	1979-80[5]	1980-81[6]	1981-82[7]	1982-83[7]
Northeast	6,152,046	2,764,127	4,054,131	2,871,225	3,881,767	6,359,777	4,986,120	2,389,483	1,160,945	2,832,979
Eastside	5,619,276	2,423,229	5,032,755	3,071,856	3,910,122	3,032,083	2,119,244	1,310,020	1,362,308	3,124,031
Southeast	1,883,948	623,990	5,859,831	5,908,729	5,222,577	2,529,316	974,921	496,275	549,504	2,371,870
Southwest	7,383,704	3,938,902	3,455,050	1,793,648	8,831,087	5,185,730	2,647,294	2,544,477	5,188,309	5,587,149
Semidi Island	-	-	-	-	-	722,600	1,292,275	1,075,482	1,210,671	907,552
N. Mainland	7,009,117	3,536,872	4,568,804	3,433,147	6,791,254	7,111,498	4,677,742	2,088,933	2,205,260	2,042,885
S. Mainland	50,419	292,554	23,638	20,651	59,255	277,921	500,247	396,155	260,645	149,419
Westside	1,722,389	171,293	4,342,700	3,620,823	4,585,410	3,954,882	1,426,032	1,447,804	1,818,517	1,910,776
TOTAL	29,820,899	13,469,966	27,336,909	20,720,079	33,281,472	29,173,807	18,623,875	11,748,629	13,756,159	18,027,061

[1] Table revised 1/79 to reflect creation of Semidi, Southeast and Southwest section from old "Southern" section and minor modification of Eastside section description. Semidi Island section added beginning 1978-79 fishing season.

[2] Fishing season November 1 - June 30.

[3] Fishing season November 1 - April 30, shortened due to price disputes and market conditions.

[4] Fishing season January 1 - April 30.

[5] Fishing season January 5 - May 15.

[6] Fishing season January 22 - May 15, shortened due to price negotiations.

[7] Fishing season February 10 - May 15.

Cultural Dynamics

SOURCE: ADF&G 1984 Westward Region Shellfish Report to the Board of Fisheries

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Unlike king and tanner crab, there are no independent assessments of dungeness stock size and status for the Kodiak area. Since market conditions have played such a determining role in effort and harvest levels over the past 10 years, harvest data are probably not a good indicator of harvestable stock size. Distribution of the stock is also likely to be distorted by harvest data since it is not yet clear that all stocks have been exploited with sufficient intensity to determine their size. In the early 1970s most harvest occurred in the Eastside, South Mainland, and Westside sections. More recently the majority of the harvest has shifted to the Southeast, South Mainland, North Mainland, and Westside sections. Table 15 presents harvest data by district for Kodiak dungeness crab from 1975 through 1984.

The label shrimp refers to five species common to the Kodiak area which have been taken in the commercial fishery. The five species are northern pink shrimp (Pandalus borealis), humpy shrimp (Pandalus goniurus), spot shrimp (Pandalus platyceros), coonstripe shrimp (Pandalus hypsinotus), sidestrip shrimp (Pandalus dispar). The most abundant species in the Kodiak area has been the pink shrimp which has consistently contributed more than 65 percent of the commercial harvest; however, humpy and coonstrip shrimp also contribute significantly. Commercial fisheries for shrimp in the Kodiak area began in 1959 and peaked in 1971 at 82.1 million pounds. The Kodiak shrimp district is coterminous with the Kodiak finfish management area running from Cape Douglas to Kilokak Rocks. The Kodiak district is divided into 16 sections (see Figure 8).

Shrimp follow the characteristic annual cycle of inhabiting shallow, nearshore and inner bays from spring to fall and moving offshore to deeper, warmer waters in the winter. Adult shrimp are generally found in dense aggregations at depths of 50 to 70 fathoms but are known to inhabit areas as deep as 350 fathoms. Juveniles are generally found in waters from 20 to 40 fathoms deep. Shrimp also follow a diurnal movement in the water column which is apparently affected by sunlight and related to feeding behavior; pink shrimp normally leave the bottom in late afternoon or evening, returning to the bottom again at dawn (ADF&G 1985a:532). Breeding and egg deposition generally occur from late September through mid-November with females moving inshore at this time. Pink shrimp are estimated to reach sexual maturity at 2.5 years in the Kodiak, Chignik, and Shumagin areas. Sexually mature pandalid shrimp may occur in one of three forms: hermaphroditic male, "primary female", and "secondary female."

Assessment of shrimp abundance in the Kodiak area is accomplished by trawl surveys and analysis of size-composition data from both the commercial catch and the research survey. Because of wide fluctuations in the size of shrimp stocks, estimates of maximum sustained yield have not been attempted. Indices of abundance from research surveys in the Kodiak area show a dramatic drop from 1978 to 1983. For example, abundance indices for Kiliuda Bay dropped from 21.3 million pounds in 1976 to .95 million pounds in 1981. Despite near complete closure of the shrimp fishery for over three years, no stock recovery is apparent. A combination of predation by cod and pollock (both recently abundant), warm waters, and commercial overexploitation are thought to be responsible for the continuing depressed state of stocks.

TABLE 15
KODIAK DISTRICT DUNGENESS CRAB HARVESTS BY SECTION
1974-1984
(Pounds)

Fishing Section	1975	1976	1977	1978	1979[1]	1980	1981-82[2]	1982-83[3]	1983-84[3]
Northeast	892	0	0	35,381	61,573	89,126	131,152	363,450	206,386
Eastside	259,096	250	103,265	420,742	459,120	224.203	510,826	484,139	437,477
Southeast	7,540	0	0	202,593	346,067	442,254	1,194,316	818,825	1,995,363
Southwest	0	0	0	42,314	34,626	71,326	280,747	590,498	575,937
N. Mainland	43,511	0	1,675	17,821	68,708	154,455	1,087,959	855,013	516,289
S. Mainland	120,403	19,890	1,115	366,348	192,551	229,546	811,223	577,474	454,646
Westside	208,371	66,970	6,971	277,107	148,630	800,826	1,550,240	856,912	564,610
Semidi Is.[4]	0	0	0	0	0	0	0	0	1,440
TOTAL	639,813	87,110	113,026	1,362,306	1,311,275	2,011,736	5,566,463	4,546,311	4,752,148

[1] Fishing section boundary between Eastside and Southeast sections revised beginning with 1979 season.
[2] Fishing season February 27, 1981 through February 1, 1982.
[3] Fishing season May 1 through February 1.
[4] Area added to Kodiak District by Board of Fisheries, 1983.

SOURCE: ADF&G 1984 Westward Region Shellfish Report to the Board of Fisheries

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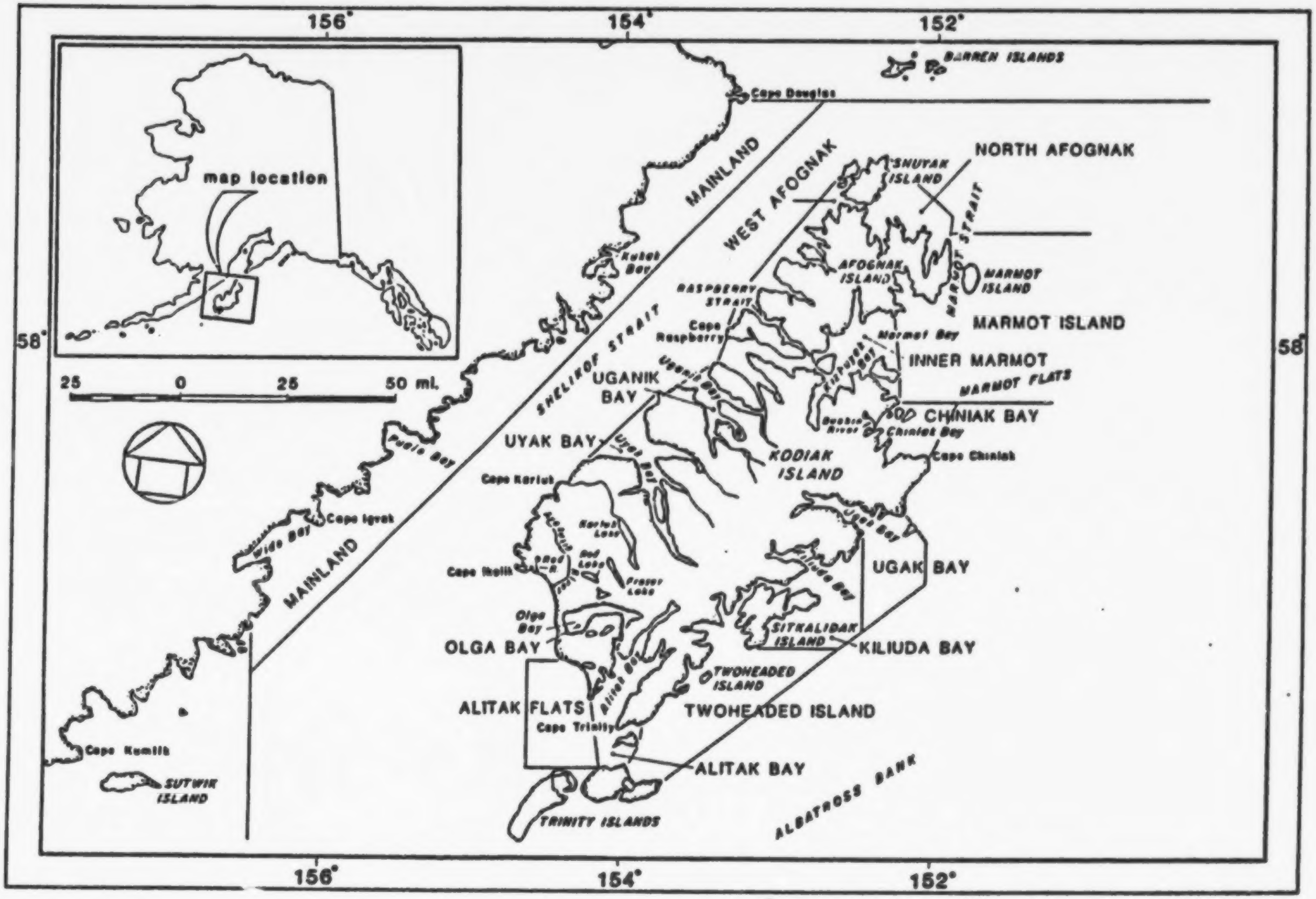
156°
154°
152°
58°
58°
156°
154°
152°
map location
25
0
25
50 mi.
Cape Douglas
BARREN ISLANDS
MAINLAND
WEST AFOGNAK
NORTH AFOGNAK
SHUYAK ISLAND
MARMOT STRAIT
AFOGNAK ISLAND
MARMOT ISLAND
MARMOT ISLAND
Kukak Bay
RASPBERRY STRAIT
Cape Raspberry
SHELIKOF STRAIT
Marmot Bay
INNER MARMOT
MARMOT FLATS
UGANIK BAY
Uganik Bay
Buskin River
Chiniak Bay
CHINIAK BAY
Cape Chiniak
UYAK BAY
Uyak Bay
KODIAK ISLAND
Puale Bay
Cape Karluk
Karluk Lake
Cape Igvak
Wide Bay
Red Lake
Frazer Lake
Cape Ikolik
MAINLAND
Ugak Bay
UGAK BAY
Kiliuda Bay
Olga Bay
OLGA BAY
SITKALIDAK ISLAND
KILIUDA BAY
Alitak Bay
TWOHEADED ISLAND
ALITAK FLATS
TWOHEADED ISLAND
Cape Trinity
ALITAK BAY
Cape Kumlik
SUTWIK ISLAND
ALBATROSS BANK
TRINITY ISLANDS

FIGURE 8
KODIAK DISTRICT SHRIMP SECTIONS

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Table 16 presents data on commercial harvests of shrimp in the Kodiak area from 1974 to 1984. The largest concentrations of shrimp have historically been found in the north and eastside bays and nearshore areas (ADF&G 1985a: 534). Two Headed Island, and Ugak Bay fishing sections (ADF&G 1985a:148). In recent years, Alitak Bay, Wide and Puale Bays in the Mainland section, and Kalsin Bay have been the only areas in which a commercial fishery has been allowed.

Three other species have made minor contributions to Kodiak area commercial fisheries. One of these is scallops which are harvested with dredges from offshore areas north and east of Kodiak Island. Begun in 1967, the scallop fishery peaked at 1.4 million pounds in 1970. The fishery declined throughout the late 1970s and early 1980s when low shrimp prices combined with higher prices in the crab fisheries. Recently greater interest has returned with the king crab collapse. Razor clams were harvested by hand digging methods in the early 1960s and again in the early 1970s but lack of mechanical harvesting methods and distance from markets has prevented this resource from being developed. Octopus are quite numerous in the Kodiak district and have received some attention. Through 1983, the highest annual commercial catch was 19,343 pounds recorded in 1980.

CHIGNIK

Trends in the distribution, abundance, and harvest levels of commercially important fisheries in the Chignik area follow. Since the basic biological characteristics of species are the same as Kodiak's, this information is omitted in the Chignik review. Groundfish characteristics and catches have already been presented as the Chirikof INPFC area includes the Chignik region.

The Chignik finfish management area extends from Kilokak Rocks on the northeast to Kupreanof Point on the southwest. The same boundaries are used for the Chignik shrimp district. For king crab, however, Chignik is considered an area within the Alaska Peninsula District (District M) whose boundaries run from Cape Kumlik to Kupreanof Point. For tanner crab, Chignik is considered a district (like Kodiak) within statistical area "J", the Westward Region.

The same five species of Pacific salmon which occur in the Kodiak management area also occur in the Chignik management area. The Chignik management area is divided into five districts which are from west to east: Perryville, Western, Chignik Bay, Central, and Eastern (see Figure 9). Table 17 presents data on the harvest (in number of fish) of Chignik management area from 1960 through 1984. After experiencing four years of catches below 1.0 million fish in the early 1970s, Chignik stocks rebounded dramatically in 1977. Since 1977, the total catch for the area has averaged 2.9 million fish, and has not fallen below 2.4 million fish. It should be noted that the 2.4 million fish level was only exceeded twice in the 16-year period from 1960 to 1976.

TABLE 16

KODIAK DISTRICT SHRIMP HARVESTS BY SECTION, 1974-1984
(Pounds)

Fishing Section	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84
Inner Marmot	2,240,884	3,051,753	2,707,340	1,482,689	473,700	0	0	1,958,074	0	0
Marmot Island	16,440,160	15,925,966	12,197,407	3,298,643	0	0	0	87,408	0	0
Chiniak Bay	2,894,115	760,727	1,009,352	33,811	1,163,818	925,388	135,804	2,598,072	1,375,664	0
Kalsin Bay	--	1,277,202	1,506,366	1,813,233						
Kiliuda Bay	8,753,689	6,608,702	6,688,416	6,059,204	0	0	0	0	0	0
Two Headed Is.	12,734,936	12,812,773	11,885,465	4,030,294	1,600	0	2,141,048	3,043,926	0	0
Southern	4,185,268	4,248,602	4,896,996	4,416,956	3,485,531	--	--	--	--	--
Alitak Bay	--	--	--	--	--	3,537,017	4,716,875	4,136,321	3,627,209	510,085
Alitak Flats	--	--	--	--	--	--	--	1,728,253	0	0
Olga Bay	--	--	--	--	1,794,091	2,259,906	1,164,641	760,179	944,057	820,675
Ugak Bay	63,167	0	0	0	0	533,598	1,052,092	104,161	0	0
Uyak Bay	722,166	329,190	478,911	1,309,710	1,003,946	0	426,800	0	0	0
Uganik Bay	1,600,954	842,553	908,027	1,481,186	367,838	0	0	0	0	0
West Afognak	664,154	831,461	986,024	258,730	879,082	478,327	1,177,302	230,562	1,003	20,701
North Afognak	3,090,640	1,033,971	1,065,966	46,407	1,149,071	1,430,362	2,204,871	748,639	1,206,275	6,617
South Mainland	0	121,930	214,185	274,484	--	--	--	--	--[2]	--[2]
Kukak Bay	480,484	1,023,566	217,998	776,989	586,496	534,187	1,167,805	549,327	--[2]	--[2]
Wide Bay[1]	--	--	--	--	--	1,181,936	977,682	926,158	--[2]	--[2]
Puale Bay[1]	--	--	--	--	--	1,841,223	663,954	1,557,845	--[2]	--[2]
Mainland	--	--	--	--	--	--	--	--	3,236,991	1,420,942
Portlock	3,765,204	218,195	1,949,630	0	--	--	--	--	--	--
Non-Section	0	0	0	0	9,600,848	141,592	11,272,344	643,066	0	0
TOTAL	58,235,982	49,086,591	46,712,083	26,409,366	20,506,021	12,863,536	27,101,218	19,111,659	10,391,207	2,779,030

[1] Prior to 1979-80 season part of the South Mainland.

[2] South Mainland.

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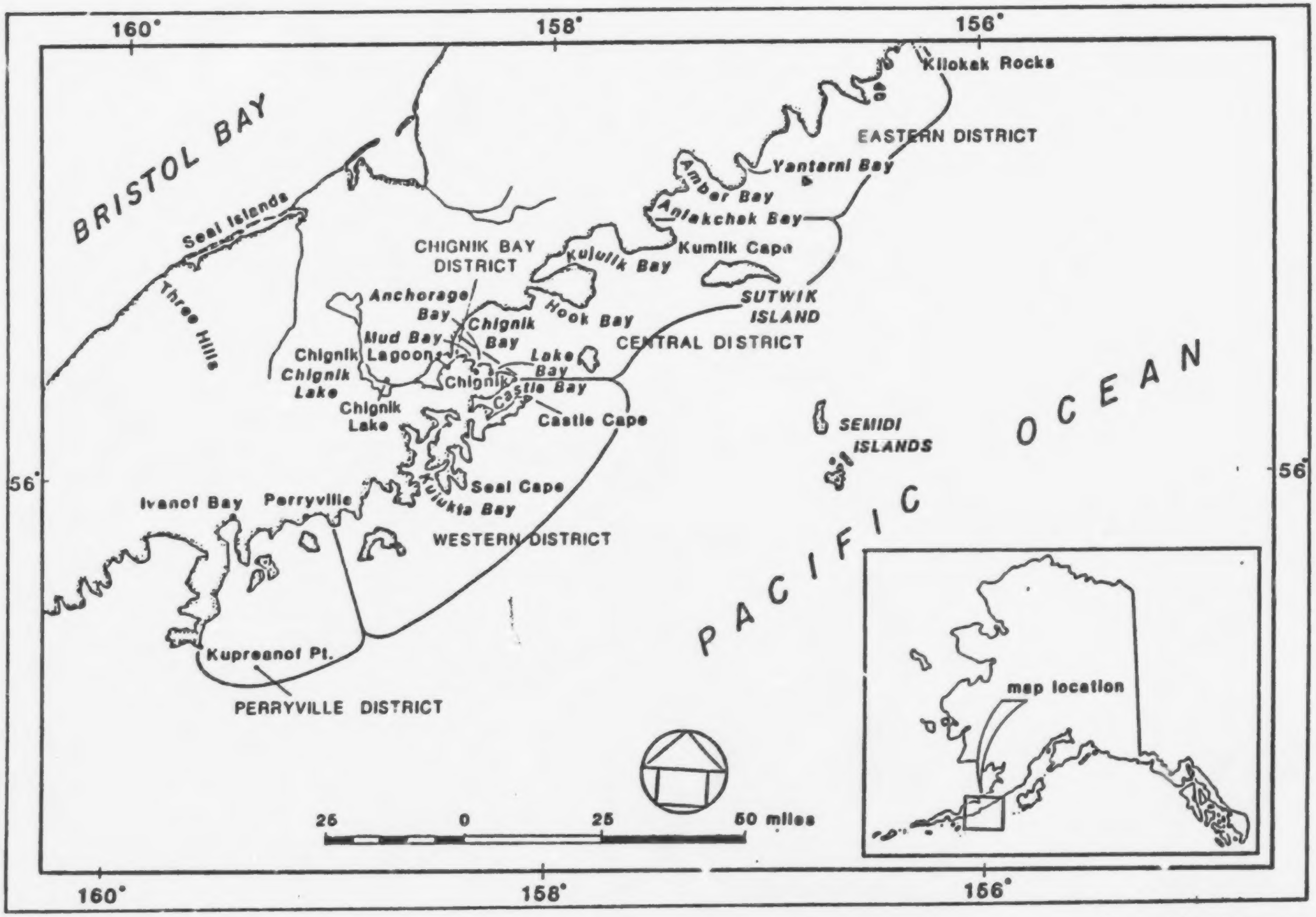
SOURCE: ADFG 1984 Westward Region Shellfish Report to the Board of Fisheries


160°
158°
156°
BRISTOL BAY
Seal Islands
Three Hills
Kilokak Rocks
EASTERN DISTRICT
Yantarni Bay
Amber Bay
Aniakchak Bay
Kumlik Cape
Kujulik Bay
CHIGNIK BAY DISTRICT
SUTWIK ISLAND
Anchorage Bay
Hook Bay
Chignik Bay
Mud Bay
CENTRAL DISTRICT
Chignik
Lagoon
Lake Bay
Chignik Lake
Chignik
Castle Bay
Chignik Lake
Castle Cape
SEMIDI ISLANDS
OCEAN
56°
56°
Seal Cape
Ivanof Bay
Perryville
Kuiukta Bay
WESTERN DISTRICT
PACIFIC
Kupreanof Pt.
PERRYVILLE DISTRICT
25
0
25
50 miles
map location
160°
158°
156°

Cultural Dynamics

FIGURE 9
CHIGNIK FINFISH MANAGEMENT AREA DISTRICTS
(For Salmon and Herring)

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TABLE 17

CHIGNIK MANAGEMENT AREA SALMON HARVEST BY SPECIES
(Thousands of Fish)

Year	Number of fish	Pounds in Thousands	Kings	Reds	Coho	Pinks	Chums
1960	1769.6		.6	716.0	8.9	557.3	486.7
1961	948.7		.4	322.9	3.1	443.6	178.8
1962	2250.1		.4	364.8	1.2	1519.3	364.3
1963	2195.3		1.7	408.6	9.9	1622.3	112.7
1964	2580.2		1.1	560.7	2.7	1682.4	333.3
1965	1885.0		1.6	635.1	9.6	1118.2	120.6
1966	1163.1		.6	224.6	16.1	683.2	238.9
1967	671.4		.9	472.9	13.2	109.0	75.5
1968	2395.8		.7	878.4	2.2	1290.7	223.9
1969	2179.1		3.4	310.1	18.1	1779.7	67.7
1970	3096.5		1.2	1327.7	15.3	1287.6	464.7
1971	1998.9		2.0	1016.1	14.6	612.3	354.0
1972	549.3		.5	378.7	19.6	72.2	78.4
1973	927.7		.5	870.7	22.3	25.4	8.7
1974	779.9		.3	662.9	12.2	70.2	34.5
1975	545.4	3839.6	.5	400.2	53.3	66.2	25.2
1976	1640.8	10929.2	.8	1135.6	35.3	388.9	80.2
1977	2705.6	20600.4	.7	1972.2	17.4	604.8	110.5
1978	2704.1	17095.1	1.6	1576.3	20.2	985.1	120.9
1979	3403.3	17808.3	1.3	1063.7	93.1	2057.0	188.2
1980	2404.6	13317.0	2.3	846.4	117.9	1125.5	312.6
1981	3663.9	14139.5	2.7	1839.5	78.8	1162.6	580.3
1982	3091.0	19894.5	5.2	1521.9	300.4	873.4	390.1
1983	2371.0	14910.1	5.5	1823.1	61.9	321.8	159.4
1984	3286.5		2.7	2662.4	110.1	446.2	63.4

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SOURCE: ADFG 1984e, ADFG Chignik Area Annual Finfish Management Reports, 1975-1983

Red salmon, comprising 49 percent of the commercial catch from 1973 to 1982, are by far the most important species. Pink salmon, comprising 28 percent of the commercial catch during this period, are the second most numerous. The third most abundant species are chum salmon, averaging 13 percent; the fourth are coho, supplying 10 percent of the annual harvest from 1973 to 1982. The least abundant species in the Chignik area is king salmon which comprised a minuscule .2 percent of the harvest. The recent substantial increase in salmon catch levels has produced record harvests for red salmon (1984), pink salmon (1979), chum salmon (1981), coho salmon (1982), and king salmon (1983) as well as for total harvest for all species (1981).

Table 18 presents Chignik area salmon harvests by district and species from 1975-1983. The salmon runs to the Chignik River, which are primarily harvested in the Chignik Bay district, are overwhelmingly the most important run in the district. Two red runs, an early run in June and a later run in July and August, enter Black and Chignik Lake respectively. An additional 5-20 percent of the Chignik River red run is estimated to be taken in interception fisheries at Cape Igvak in the Kodiak management area and in Stepovak Bay in the Peninsula-Aleutians management area. The Chignik River also produces the majority of the coho salmon caught in the district. From 1975 to 1983, commercial harvests in the Chignik area were always greatest in the Chignik Bay district with a peak of 89.7 percent of total catch in 1975 and a nadir (lowest level) of 38.3 percent of total area catch in 1979. The average area contribution of the district over that period was 61 percent.

The Western district, usually the largest producer of pink salmon in the area, is the second most productive district with an average annual contribution of 16.9 percent of total catch from 1975 to 1983. The other three districts each averaged less than 10 percent annual contribution to area harvests from 1975-83: Central distict--9.4 percent, Eastern district--6.9 percent, and Perryville district--5.8 percent. The Eastern District is characterized by relatively good pink salmon runs in even years and virtually no pink production in odd years.

Herring have been harvested for sac roe in the Chignik area since 1980. Catch levels for meal, oil, and food from herring fisheries conducted during the first three decades are not available and commercial fishing on Chignik herring stocks did not resume until 1980. Table 19 presents sac roe harvest levels from 1980 to 1984 by district--the same districts are used for herring as for salmon. The catch level has decreased each year since the initial harvest of 694 short tons in 1980. No serious attempt has been made in recent years to develop a food/bait fishery on Chignik herring stocks. Amber Bay and Aniakchak Bay have consistently been the major producing locations in the Chignik area. Together they provide over 90 percent of the area's harvest in every year except 1984.

Halibut are an important resource in the Chignik region that have been harvested commercially since about 1916 (Bell 1982:26). IPHC statistical areas 30 and 31, running from the eastside of Chirikof Island to just east of Kupreanof Point (see Figure 3), most closely correspond to the Chignik region. Halibut catches from 1970 to 1983 from those areas are presented in Table 20. Catch levels from the Chignik areas were similar to those from the Kodiak areas (27, 28, 29) from 1970 to 1972; however since that time catch levels in the Kodiak areas have consistently been higher than from the Chignik areas.

TABLE 18
CHIGNIK MANAGEMENT AREA SALMON HARVESTS BY SPECIES AND DISTRICT, 1975-1983
(Thousands of Fish)

District/ Species	YEAR								
	1975	1976	1977	1978	1979	1980	1981	1982	1983
Chignik Bay									
Kings	.5	.6	.7	1.4	.9	.9	2.0	3.3	3.6
Reds	387.7	1084.7	1851.7	1474.7	904.9	701.1	1355.5	1414.0	1596.1
Cohos	52.4	34.4	16.8	14.5	53.4	45.9	35.6	132.4	29.5
Pinks	27.4	104.3	60.9	137.1	312.6	180.6	121.4	83.0	27.3
Chums	21.1	18.2	8.6	15.0	31.3	27.2	38.1	16.0	16.7
Total	489.2	1242.2	1938.8	1642.6	1303.1	955.7	1552.5	1648.6	1673.2
Central (272-20/84)									
Kings	*	*	*	*	.1	.1	.3	*	.2
Reds	12.4	48.4	119.5	89.8	100.2	67.9	426.2	66.3	.4
Cohos	.3	.2	.2	*	3.5	9.1	8.7	6.6	.3
Pinks	31.3	16.4	120.0	61.2	277.3	106.5	210.0	80.6	7.8
Chums	3.2	3.4	8.9	10.3	11.2	95.4	160.7	33.7	9.8
Total	47.2	68.4	248.6	161.3	392.3	279.0	805.9	187.2	141.5
Eastern (272-60/96)									
Kings	0	*	0	*	*	.2	.2	*	.3
Reds	0	1.0	0	7.2	17.3	62.2	36.6	10.2	73.8
Cohos	0	.1	*	*	3.9	14.6	6.2	31.5	.4
Pinks	0	28.8	.2	86.8	271.3	514.8	173.3	89.1	7.8
Chums	0	10.0	1.5	17.5	32.6	56.8	108.6	64.5	8.2
Total	0	39.9	1.8	111.5	325.1	648.6	324.9	195.3	90.6
Western (273)									
King	0	.1	*	.1	.2	.7	.1	1.4	1.4
Reds	*	.2	.9	4.5	22.2	9.3	14.8	30.3	25.2
Cohos	0	.2	.4	3.8	31.7	34.5	22.0	122.7	27.2
Pinks	7.4	134.8	379.0	419.3	746.0	215.6	433.6	602.4	164.3
Chums	.8	33.0	88.0	46.0	83.2	91.9	221.6	253.3	101.5
Total	8.2	168.4	468.3	473.7	883.4	352.1	692.1	1010.0	320.1
Perryville (275)									
Kings	0	.1	*	*	.1	.4	.1	.5	.1
Reds	0	1.2	.1	.1	2.9	5.9	6.4	1.1	4.5
Cohos	.6	.4	*	1.9	7.4	13.9	6.3	7.3	4.5
Pinks	0	104.7	44.6	280.8	269.4	107.9	224.3	18.3	113.9
Chums	0	15.6	2.3	32.1	26.1	41.2	51.3	22.6	22.6
Total	.6	121.9	47.0	314.9	305.9	169.2	288.4	49.8	145.6

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* = Less than 50 fish

SOURCE: ADFG, Chignik Area Annual Management Reports, 1975-83

There are several important halibut fishing grounds with the Chignik statistical areas. In area 30 are the Chirikof Spit, located southwest of Chirikof Island, and the Chirikof Gully, located due west of Chirikof Island (St.Pierre 1984:8). In area 30 the most important fishing ground is the Shumagin Gully which extends shoreward from the 100 fathom line near the western edge of the area. It is noteworthy that none of these important fishing grounds are easily accessible from Chignik area communities. All three commercially important species of crab are harvested in the Kodiak area. Table 21 presents harvest data for the three species in the Chignik area from 1972-1984.

King crab, relatively rare in the Chignik district, consist only of red king crab. Chignik district king crab tend to be larger than those of Kodiak or South Peninsula. Some biologists think the area is populated by larger and older crab moving in from the other two areas. Table 21 indicates that the fishery peaked in 1973-74 at 385,000 pounds and plummeted dramatically in 1981. Although there were commercial harvests in the 1950s, catch statistics for the district were not kept until 1968, and intensive harvesting did not begin until 1974. Table 21 also presents harvests by district from 1978 through 1984. The same decline of king crab observed in the Kodiak district is also apparent in Chignik. No harvests were allowed in 1983, 1984 or 1985. The most productive grounds in the Chignik district for king crab have been the Western and Central areas. Grounds around Mitrofania Island have typically been major producing areas. When last conducted in 1982, the Chignik king crab fishery took place in September and October.

Tanner crab are more abundant in the Chignik district than are king crab and separate areas have been established for monitoring tanner stocks (see Figure 10). As is apparent from Table 21, tanner crab stocks continued at fairly high levels after peaking in 1975-76. Recent surveys of abundance, however, have been poor and lower catches than those taken in the early 1980s are projected for the near future.

Table 22 presents Chignik district tanner crab harvests from 1980 to 1984 by statistical area while Table 23 presents the same data by major fishing area. Table 22 indicates that most of the harvest is taken in waters offshore, that is, outside of three miles. Of the inshore districts, Central and Perryville have been most productive. Table 23 makes it quite clear that the Mitrofania Island area is the most productive area for tanner crab fishing in the Chignik district. The Chignik tanner crab fishery has been conducted in February and March in recent years.

Dungeness crab have recently become the target of commercial effort after sporadic and limited quantities were harvested in the 1970s. Recent interest is likely because of the decline of king crab. Harvesting, which began in the Kodiak district earlier, only started spilling over into Chignik in 1981. As indicated in Table 21, harvests have expanded rapidly

TABLE 19

CHIGNIK MANAGEMENT AREA HERRING SAC ROE HARVESTS BY DISTRICT, 1980-1984
(Short Tons)

District	YEAR 1980		1981		1982		1983		1984	
	No.	Tons	No.	Tons	No.	Tons	No.	Tons	No.	Tons
Chignik Bay (271)	NA	48	4	18.5	0	0	0	0	0	0
Central (272-20/64)	NA	67	3	47.5	0	0	0	0	0	0
Eastern (272-60/96)	NA	305	14	227.0	6	177.2	10	88.0	0	0
Western (273)	NA	128	17	124.0	2	6.2	2	2.0	0	0
Perryville (275)	NA	146	1	30.2	1	6.7	0	0	0	0
Total	NA	694	33	447.3	8	190.1	10	90.0	0	0

SOURCE: ADF&G 1984f

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TABLE 20

CHIGNIK AREA HALIBUT CATCH, 1970-1983
(Statistical Areas 30 and 31)
(Thousands of Pounds)

Year	Statistical Area 30	31	Total
1970	3915	3207	7122
1971	2117	3486	5603
1972	2721	1327	4048
1973	1131	873	2004
1974	330	358	688
1975	557	540	1097
1976	654	335	989
1977	486	299	785
1978	257	306	563
1979	35	40	75
1980	41	28	69
1981	0	50	50
1982	873	495	1368
1983	1436	551	1987
Average	1039	850	1889

SOURCE: Myhre et al 1976 and personal communication

TABLE 21

CHIGNIK AREA KING, TANNER, AND DUNGENESS HARVESTS
1972-73 to 1983-84
(Thousands of Individuals and Pounds)

Year	KING		TANNER		DUNGENESS	
	No.	Lbs.	No.	Lbs.	No.	Lbs.
1972-73	17.9	133.3	-	-	86.7	194.5
1973-74	45.0	385.3	1643.6	4202.7	-	-
1974-75	12.6	97.8	1438.5	3649.4	-	-
1975-76	18.3	131.8	2724.5	6926.2	-	-
1976-77	9.9	76.4	2098.2	5672.9	-	-
1977-78	27.1	200.7	1725.0	4693.8	-	-
1978-79	17.2	138.1	926.3	2536.1	-	-
1979-80	20.5	168.4	2340.0	3517.9	-	-
1980-81	24.3	194.1	1534.8	3653.7	-	-
1981-82	3.4	32.0	1343.5	3240.6	NA	1.1
1982-83	7.1	56.0	1432.0	3497.4	106.6	243.5
1983-84	0	0			297.7	665.2

CHIGNIK DISTRICT KING CRAB HARVESTS BY STATISTICAL AREA, 1978-79 to 1983-84
(Thousands of Pounds)

STATISTICAL AREA	YEAR					
	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84
Chignik Bay (271)	0	0	0	0	0	0
Central (272-20/64)	60.2	72.7	30.6	2.0	1.1	0
Western (273)	51.6	74.7	150.7	29.0	37.8	0
Perryville (275)	24.2	0	12.8	1.0	17.1	0
Other (282)	2.1	0	0	0	0	0
Offshore (277)[1]	0	21.0	0	0	0	0
Total	138.1	168.4	194.1	32.0	56.0	0

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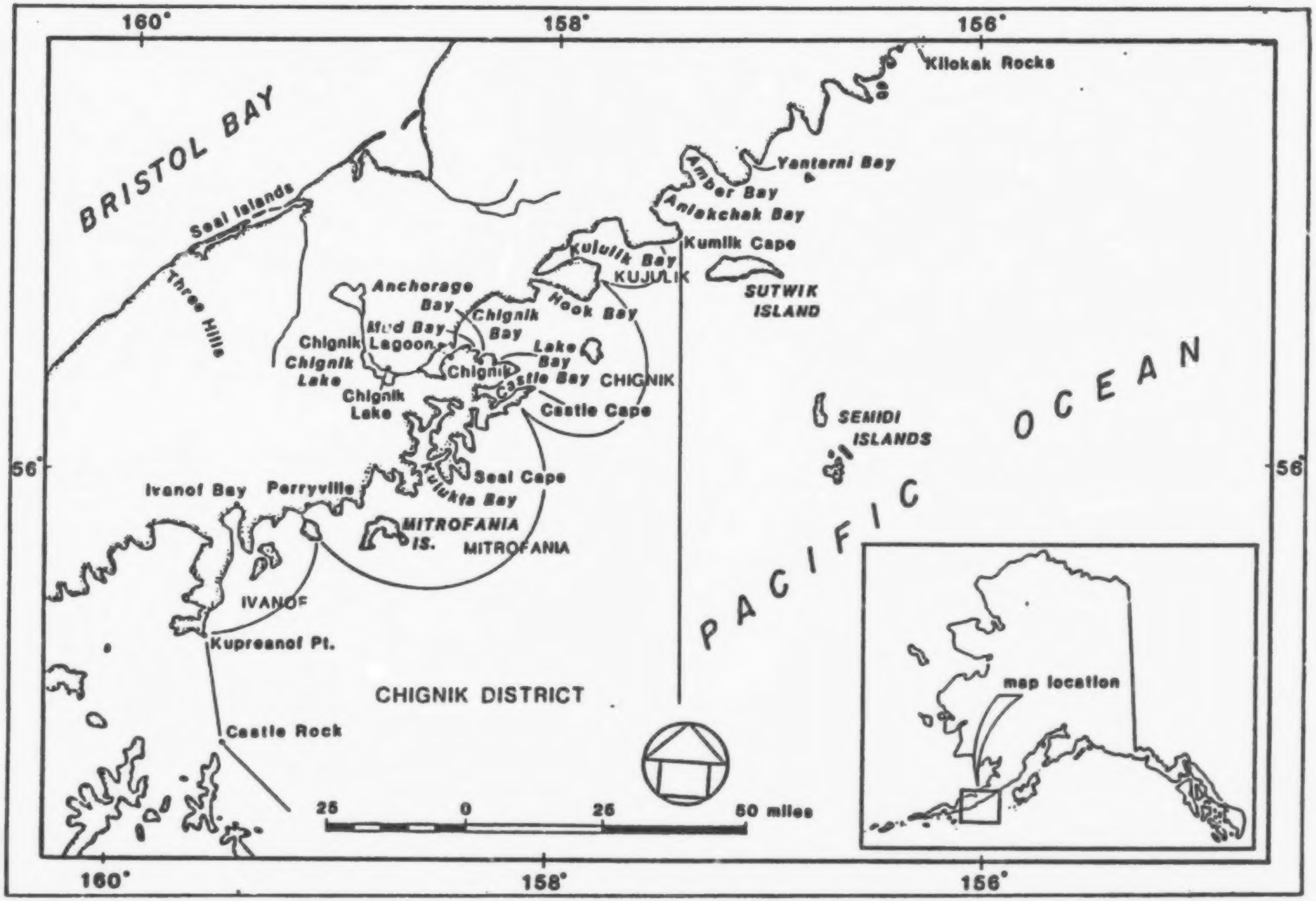
[1] Offshore refers to the area seaward of the salmon districts.

SOURCE: ADFG 1984 Westward Region Shellfish Report to the Board of Fisheries

FIGURE 10

CHIGNIK DISTRICT TANNER CRAB FISHING AREAS


160°
158°
156°
56°
BRISTOL BAY
Seal Islands
Three Hills
Anchorage Bay
Mud Bay
Chignik Lagoon
Chignik
Chignik Lake
Chignik Lake
Chignik Bay
Chignik
Lake Bay
Castle Bay
CHIGNIK
Castle Cape
Hook Bay
Kujulik Bay
KUJULIK
Kumlik Cape
Aniakchak Bay
Amber Bay
Yantarni Bay
Kilokak Rocks
SUTWIK ISLAND
SEMIDI ISLANDS
PACIFIC OCEAN
Seal Cape
Kuiukta Bay
MITROFANIA IS.
MITROFANIA
Ivanof Bay
Perryville
IVANOF
Kupreanof Pt.
Castle Rock
CHIGNIK DISTRICT
25
0
25
50 miles
map location

Cultural Dynamics

TABLE 22

CHIGNIK DISTRICT TANNER CRAB HARVESTS BY STATISTICAL AREA, 1980-1984

(Thousands of Pounds)

STATISTICAL AREA	YEAR 1980-81	1981-82	1982-83	1983-84
Chignik Bay (271)	4.4	0	0	
Central (272-20/64)	432.7	709.2	559.9	
Western (273)	387.4	157.0	211.8	
Perryville (275)	1.2	745.7	915.7	
Offshore (277)[1]	2820.3	1628.7	1796.6	
Total	3646.0	3240.6	3484.0	

---

[1] Offshore refers to areas outside salmon districts.

TABLE 23

CHIGNIK DISTRICT TANNER CRAB HARVESTS BY MAJOR FISHING AREAS, 1980-84

(Thousands of Pounds)

MAJOR FISHING AREA	YEAR 1980-81	1981-82	1982-83	1983-84
Ivanof	448.2	309.2	549.2	
Mitrofania	2334.1	1476.8	2179.8	
Chignik	786.1	519.6	763.0	
Kuiukta	66.2	383.3	5.3	
TOTAL	3634.6	2688.9	3497.3	

SOURCE: 1984 ADF&G Westward Region Shellfish Report since that time. No subdivisions of Chignik dungeness catches by statistical area or fishing area are available. No stock status or abundance studies have been conducted. Based strictly on catch levels, the Department of Fish and Game considers the stock to be stable (ADF&G 1984:94). In recent years, the Chignik dungeness fishery has taken place from July to November with the largest harvests recorded from August to October.

Shrimp have been an important component of domestic commercial fisheries in the Chignik area since 1968; prior to that year, Russian and Japanese fishermen harvested them. Following declines in Kodiak area shrimp harvests in 1971, a more intensive fishery on Chignik stocks developed as Kodiak vessels moved westward. Figure 11 displays Chignik district shrimp sections, and Table 24 summarizes Chignik shrimp and scallop harvests from 1975 to 1984. Chignik shrimp harvests peaked in 1977 at 27.8 million pounds and fell off sharply in 1980. Although there have been openings for commercial shrimping in the past several seasons, no catches have been landed. Stocks are considered to be at very low levels from the same combination of factors thought to be causing continuing low levels of shrimp availability in the the Kodiak area. Table 25 presents Chignik shrimp harvests by section from 1973 to 1984. The early fishery was developed primarily around Mitrofania Island where catches peaked at 19.3 million pounds in 1974-75. Efforts then shifted to Chignik Bay and Kujulik Bay from which peak harvests were taken in 1978-79 and 1979-80 respectively. The Sutwik Island section was the last to be exploited prior to the collapse of the shrimp stocks in 1981.

Scallops are available but not abundant in the Chignik area (ADF&G 1984:102). They have been harvested on an intermittent basis over the last 20 years. The most recent efforts to commercially harvest them began in 1981. As Table 23 indicates, a peak harvest of 172,333 pounds was taken in 1982. Mitrofania Island appears to be the area with the greatest scallop abundance.

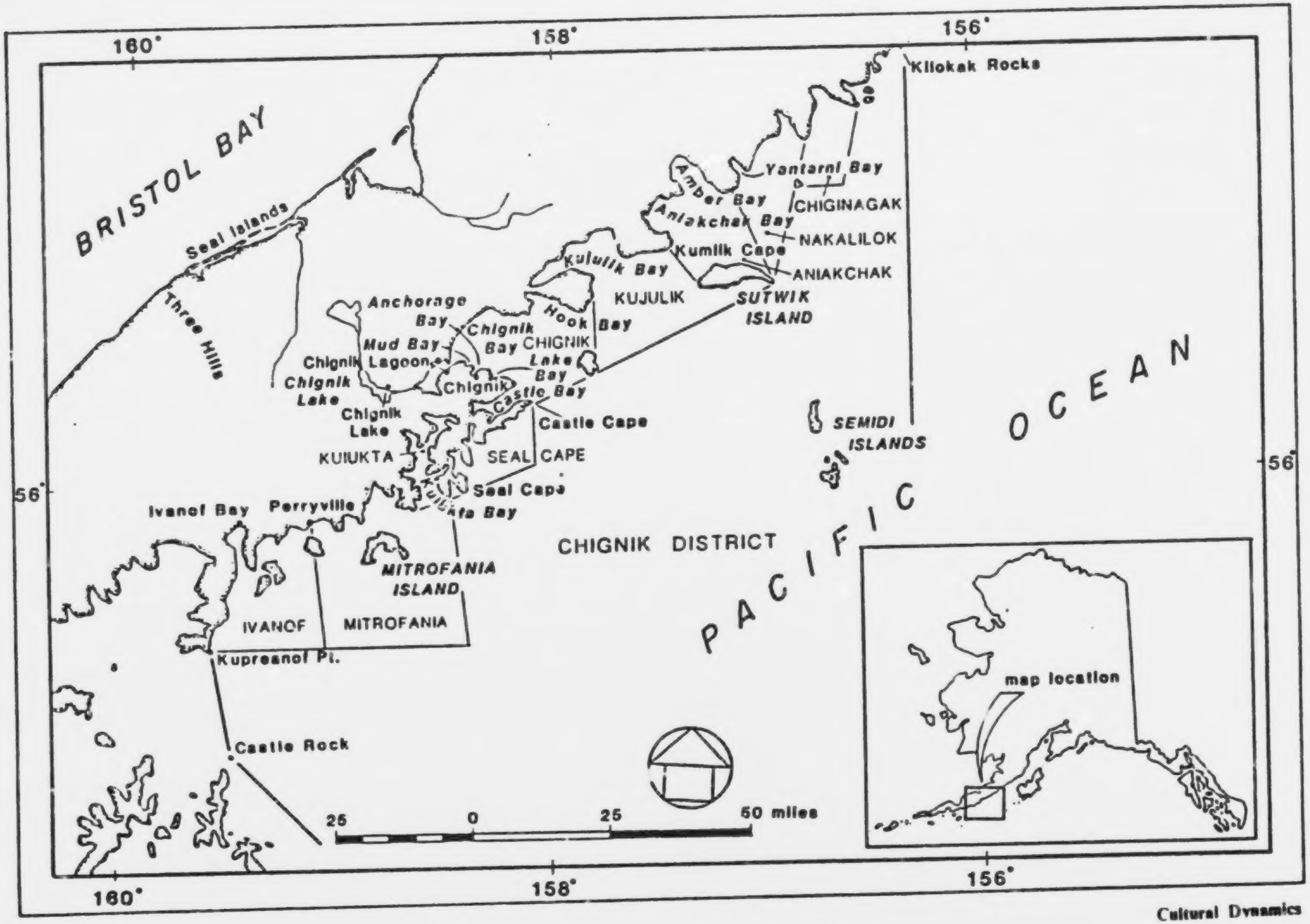
No octopus have been harvested and landed from the Chignik area as a result of a directed fishery or incidental catch.

The Industry

In this section the commercial fishing industry operating in the Kodiak and Chignik regions is discussed. The harvesting sector, including fishermen's organizations, is first covered followed by the processing sector. A special discussion of developments in groundfishing is the last topic in the industry section.

HARVESTING: KODIAK REGION

Two topics are presented here: participation in the fisheries, including fleet characteristics; and the value of fisheries harvests on a regional basis, including distribution of that value among different residential groupings of fishermen. Discussion of returns from the fisheries at the community level is left until the next section.


160°
158°
156°
56°
BRISTOL BAY
Seal Islands
Three Hills
Kilokak Rocks
Yantarni Bay
CHIGINAGAK
Amber Bay
Aniakchak Bay
NAKALILOK
Kumlik Cape
ANIAKCHAK
Kujulik Bay
KUJULIK
SUTWIK ISLAND
Anchorage Bay
Hook Bay
Chignik Bay
CHIGNIK
Mud Bay
Chignik Lagoon
Chignik Lake
Chignik Lake Bay
Chignik
Castle Bay
Castle Cape
SEAL CAPE
KUIUKTA
Seal Cape
Kuiukta Bay
SEMIDI ISLANDS
Ivanof Bay
Perryville
MITROFANIA ISLAND
IVANOF
MITROFANIA
CHIGNIK DISTRICT
PACIFIC OCEAN
Kupreanof Pt.
Castle Rock
25
0
25
50 miles
map location

Cultural Dynamics

FIGURE 11
CHIGNIK DISTRICT SHRIMP SECTIONS

BEST COPY AVAILABLE

TABLE 24

CHIGNIK DISTRICT SHRIMP, SCALLOP AND GROUNDFISH HARVESTS
1973-1983
(Thousands of Pounds)

Year	Shrimp	Scallops	Groundfish[1]
1973	NA	-	0
1974	NA	-	0
1975	24,435.4	-	85.7
1976	27,059.7	-	109.1
1977	27,797.7	-	70.6
1978	22,976.7	-	354.7
1979	23,722.3	-	375.2
1980	12,843.3	-	-
1981	70.9	17.0	157.5
1982	-	172.3	-
1983	-	23.2	1.0

Cultural Dynamics 1986

[1] Directed catch by domestic fishermen landed in Alaska

SOURCE: ADFG 1984 Westward Region Shellfish Report to the Board of Fisheries

TABLE 25

CHIGNIK DISTRICT SHRIMP HARVESTS BY SECTION, 1973-74 - 1983-84 (Thousands of Pounds)

Section	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81	81-82	82-83	83-84
Ivanof	400.0	300.0	200.0	1751.3	3311.5	2165.6	0	0	0	0	0
Mitrofania	9800.0	19300.0	6000.0	9691.9	8221.2	4054.8	2690.1	0	0	0	0
Kuiukta	600.0	2600.0	3000.0	1843.6	1229.6	1736.9	90.0	13.7	0	0	0
Seal Cape	2200.0	500.0	4100.0	2101.6	1096.9	126.9	0	19.9	0	0	0
Chignik	4900.0	2700.0	7000.0	4810.1	5446.5	8833.3	5833.3	5370.4	0	0	0
Kujulik	2800.0	1700.0	3500.0	6641.5	5793.3	6026.7	11047.4	3372.4	0	0	0
Aniakchak	0	0	0	0	0	0	0	0	0	0	0
Nakalilok	0	0	0	0	0	0	0	0	0	0	0
Chiginagak	0	0	0	0	0	0	0	0	70.9	0	0
Sutwik	1000.0	900.0	500.0	312.3	1402.4	313.7	4061.5	4066.9	0	0	0
TOTAL	21700.0	28000.0	24300.0	27152.3	26501.4	23,257.9	23722.3	12843.3	70.9	0	0

SOURCE: ADFG 1984 Westward Region Shellfish Report to the Board of Fisheries

Participation in the Limited Fisheries

In the Kodiak area there are three limited salmon fisheries for which permanent permits were issued in 1975: purse seine, beach seine, and set gillnet. In 1983 limited entry was extended to the Kodiak herring purse seine and gillnet fishery after several years of acrimonious debate between the Commercial Fisheries Entry Commission and Kodiak area fishermen who did not wish to be limited. Information on the herring fisheries follows discussion of the salmon fishery.

Geographic Distribution of Salmon Permit Owners

We turn now to the distribution of salmon permit ownership among residents of different geographic areas along with changes from 1975 to 1983 in the patterns of ownership and permit values. Table 26 summarizes the patterns of ownership of the three salmon permits. Owners are divided into five geographic categories based upon their residence. The Kodiak management area is termed local for these three fisheries. Kodiak is considered urban because its 1980 population exceeded 2,000. Permit holders who reside in Kodiak are classified as urban local. Permit holders who are residents of the rural villages of the Kodiak archipelago, all of which are less than 2,000 in population, are classified as rural local. Permit holders who are residents of other Alaskan communities outside the Kodiak area that have 2,000 or more in population are classified as urban nonlocals. Permit holders who are residents of Alaskan rural locations with less than 2,000 people outside the Kodiak area are classified as rural nonlocals, and permit holders who live outside of Alaska are classified as nonresident.

Changes in the residence of permit holders can result from two processes--migration of a permit holder from one location to another and transfer of a permit from a resident of one location to a resident of another location. For Kodiak area permits, as for other Alaskan regions and permits, transfers account for more than 67 percent of changes in permit distribution while migration accounts for less than 33 percent.

The basic pattern in the Kodiak area of permit ownership is not dissimilar to that found elsewhere in Alaska. Rural local permit holders have declined both absolutely and proportionately from their levels of initial permit distribution. Table 26 indicates that rural local ownership of permits has declined in all three Kodiak area permits over the 1975-1983 period relative to other residency groups. Purse seine permit ownership has declined the least, dropping from 21.9 percent in 1975 to 21.7 percent in 1983. Beach seine ownership has declined a significant amount absolutely, the loss of four permits representing 36 percent of the peak rural holdings, but an even greater amount proportionatey because permanent permits issued in later years have gone overwhelmingly to Kodiak city residents. Set gillnet ownership has seen the greatest decline in rural owner dropping from 37 permits in 1976 and 24.5 percent of all permits in 1975 to 18 permits and 9.7 percent of all permits in 1983. For all three salmon permits taken together, rural local ownership has dropped from a 24.5 percent share in 1975 to 16.6 percent in 1982.

The permits that have been transferred from rural ownership have ended up primarily in the hands of Kodiak city residents and other urban Alaskan residents. Kodiak city residents increased their absolute level of Kodiak area salmon permit ownership from 208 (42.2 percent) in 1975 to 287 (48.5 percent) in 1983. Increases were experienced in all three fisheries with the sharpest growth occurring in set gillnet permits. Note that the number of limited entry permits held by Kodiak residents for all limited fisheries in Alaska increased by 33 from initial issuance to the end of 1983.

Other urban Alaskans increased their absolute holdings of Kodiak area salmon permits from 25 permits in 1975 to 45 permits in 1983. Proportionately, this represents a shift of from 5.1 to 7.5 percent. Although permit increases were recorded in all three fisheries, the 10 permit increase in the purse seine fishery is the most significant.

The nonresident share of Kodiak area salmon fisheries declined slightly from 129 or 25.9 percent in 1975 to 142 or 24 percent in 1983. Ownership of purse seine permits had dropped 92 to 89 in 1983, proportionately from 27.5 to 23.6 percent. Nonresidents increased their holdings in set gillnet permits from 36 (25.9 percent) to 50 (26.9 percent).

Rural nonlocal ownership dropped slightly from 3.2 percent of permits in 1975 to 2.5 percent in 1983. The primary reason for this was the decline in purse seine permit ownership.

While Table 26 reveals annual snapshots of the distribution of permits, it does not reveal the full picture. A more complete portrayal can be seen by examining the pattern of initial issuance; this means tracking ownership based on the geographic residence of the individual to whom a permanent permit was originally awarded regardless of the year in which that took place. This is necessary because permanent permits continued to be issued through 1982 in the three fisheries as a result of administrative appeals and legal cases, with large numbers issued in 1976 and minor additions in 1977 and again in 1978. By 1979 the total number of permanent permits had reached 588, but since then only eight additional permits have been issued.

The trends revealed by tracing transfer patterns are even more dramatic than the annual snapshots for two of the Kodiak area salmon permits. A total of 76 purse seine permits were originally issued to Kodiak rural locals; however by the end of 1983, 82 were in the hands of rural locals. This came about when six owners of permits from other residence categories migrated to a Kodiak rural location, while no permits were lost from transfers (Dinneford 1984:148). Urban locals (Kodiak city residents) gained seven purse seine permits between 1975 and 1983, going from 159 to 166; 23 permits were added from transfers and 16 were lost to outmigration. Alaskan urban nonlocals increased their holdings by six permits rising from an initial level of 20 to 26 (one net gain from a transfer and five from migration). Rural nonlocals lost four of their 14 original permits, all as a result of transfers. Finally, nonresident purse seine permit ownership declined by 19 permits from 108 to 89; the loss was of 23 permits from transfers and the gain was of four permits from migration.

TABLE 26

KODIAK SALMON PERMIT OWNERSHIP BY RESIDENCY, 1975-1983

Year	Rural Local	Rural Non-Local	Urban Local	Urban Non-Local	Non-Resident	Total
1975						
Purse Seine	73 (21.9%)	14 (4.2%)	139 (41.6%)	16 (4.8%)	92 (27.5%)	334
Beach Seine	9 (42.9%)	0 (0.0%)	10 (47.6%)	1 (4.8%)	1 (4.8%)	21
Set Net	34 (24.5%)	2 (1.4%)	59 (42.4%)	8 (5.8%)	36 (25.9%)	139
Total	116 (23.5%)	16 (3.2%)	208 (42.1%)	25 (5.1%)	129 (26.1%)	494
1976						
Purse Seine	75 (20.9%)	15 (4.2%)	156 (43.6%)	16 (4.5%)	96 (26.8%)	358
Beach Seine	11 (47.8%)	1 (4.3%)	9 (39.1%)	1 (4.3%)	1 (4.3%)	23
Set Net	37 (22.0%)	1 (.6%)	87 (49.4%)	8 (4.5%)	43 (24.4%)	176
Total	123 (22.1%)	17 (3.0%)	252 (45.2%)	25 (4.5%)	140 (25.1%)	557
1977						
Purse Seine	74 (20.3%)	14 (3.8%)	161 (44.1%)	21 (5.7%)	95 (26.0%)	365
Beach Seine	9 (30.0%)	0 (0.0%)	16 (53.3%)	2 (6.7%)	3 (10.0%)	30
Set Net	37 (20.9%)	1 (0.5%)	87 (48.1%)	12 (6.6%)	44 (24.3%)	181
Total	120 (20.9%)	15 (2.6%)	264 (45.9%)	35 (6.1%)	142 (24.7%)	575
1978						
Purse Seine	73 (19.7%)	12 (3.2%)	160 (43.1%)	24 (6.5%)	102 (27.5%)	371
Beach Seine	9 (27.3%)	1 (3.0%)	20 (60.6%)	0 (0.0%)	3 (9.1%)	33
Set Net	36 (19.6%)	0 (0.0%)	91 (49.5%)	12 (6.5%)	45 (24.5%)	184
Total	118 (20.1%)	13 (2.2%)	271 (46.1%)	36 (6.1%)	150 (25.5%)	588
1979						
Purse Seine	74 (19.8%)	12 (3.2%)	161 (43.0%)	25 (6.7%)	102 (27.3%)	374
Beach Seine	7 (21.2%)	0 (0.0%)	20 (60.6%)	3 (9.1%)	3 (9.1%)	33
Set Net	28 (15.1%)	2 (1.1%)	95 (51.3%)	13 (7.0%)	47 (25.4%)	185
Total	109 (18.4%)	14 (2.4%)	276 (46.6%)	41 (6.9%)	152 (25.7%)	592
1980						
Purse Seine	81 (21.6%)	12 (3.2%)	158 (42.1%)	25 (6.7%)	99 (26.4%)	375
Beach Seine	7 (20.6%)	1 (2.9%)	19 (55.9%)	3 (8.9%)	4 (11.8%)	34
Set Net	23 (67.6%)	4 (22.2%)	98 (52.7%)	13 (7.0%)	48 (25.8%)	186
Total	111 (18.7%)	17 (2.9%)	275 (46.2%)	41 (6.9%)	151 (25.4%)	595

Continued next page

TABLE 26 (Continued)

KODIAK SALMON PERMIT OWNERSHIP BY RESIDENCY, 1975-1983

Year	Rural Local	Rural Non-Local	Urban Local	Urban Non-Local	Non-Resident	Total
1981						
Purse Seine	79 (21.1%)	12 (3.9%)	161 (42.9%)	28 (7.5%)	95 (25.3%)	375
Beach Seine	9 (26.5%)	2 (5.9%)	17 (50.0%)	2 (5.9%)	4 (11.8%)	34
Set Net	19 (10.2%)	5 (2.7%)	104 (55.9%)	12 (6.4%)	46 (24.7%)	186
Total	107 (18.0%)	19 (3.2%)	282 (47.4%)	42 (7.1%)	145 (24.4%)	595
1982						
Purse Seine	77 (20.5%)	10 (2.7%)	171 (45.5%)	26 (6.9%)	92 (24.5%)	376
Beach Seine	7 (20.6%)	2 (5.9%)	19 (55.9%)	2 (5.9%)	3 (8.8%)	34
Set Net	15 (8.1%)	5 (2.7%)	104 (55.9%)	12 (6.4%)	50 (26.9%)	186
Total	99 (16.6%)	17 (2.8%)	294 (49.3%)	40 (6.7%)	145 (24.3%)	596
1983						
Purse Seine	82 (21.8%)	10 (2.7%)	166 (44.1%)	29 (7.7%)	89 (23.7%)	376
Beach Seine	6 (20.0%)	0 (0.0%)	20 (66.7%)	2 (6.1%)	2 (6.1%)	30
Set Net	18 (9.7%)	5 (2.7%)	99 (53.2%)	14 (7.5%)	50 (26.9%)	186
Total	106 (17.9%)	15 (2.5%)	285 (48.1%)	45 (7.6%)	141 (23.8%)	592

Source: Dinneford, E. and N. Kamali 1984:131-133; Dinneford 1984:23

The beach seine and set gillnet fisheries are more characteristic in that changes in ownership have increased urban local holdings and decreased rural local holdings. In the beach seine fishery a total of 11 permits were initially issued to rural locals; by 1983 the number had dwindled to seven as the result of three tranfers and one migration. Urban locals who were initially issued 19 permits had 22 by the end of 1983, all transfers. Very minor changes characterized holdings by rural nonlocals, urban nonlocals, and nonresidents in this fishery.

In the set gillnet fishery rural residents experienced the most dramatic loss in any Kodiak fishery. Of the 42 permits initially issued to them, only 18 were held by the end of 1983. Twelve permits were lost from transfers and 12 from migrations. The urban local population increased their holdings from an initial issuance of 78 to 99 as the result of 19 transfers and 2 migrations. Nonresident holdings held steady at 50 from initial issuance to 1983 despite transfers and migrations. Urban nonlocals remained stationary after being issued 14 permits, the same number that were held at the end of 1983. Rural nonlocal set gillnet owners increased from initial issue of 2 to 5 from a combination of transfers and migration.

Alaskan Native Kodiak Salmon Permit Ownership

A major problem facing the rural Alaskan Native economy in recent years has been the loss of limited entry permits through sales to non-Natives. Recent research by Kamali (1984:14) has revealed that on a statewide basis, Natives have lost 735 permits or 13.8 percent of the initial Alaskan Native proportion of permit ownership. The Kodiak area certainly reflects this trend. Table 27 presents the initial pattern of Native holdings of Kodiak salmon limited entry permits by residence category. Alaskan Natives were issued 216 of 598 permits (36.1%) of which their largest holding was in the purse seine fishery where 154 permits constituted 41% of the total issued. They held 50 of 186 (27%) set gillnet permits and 12 of 35 (34%) of beach seine permits.

In terms of residence, most Alaskan Natives who received Kodiak salmon permits lived in Kodiak city (urban locals) or Kodiak villages (rural locals). Rural local Alaskan Natives received 105 limited entry permits representing 48.6 percent of all Native Kodiak salmon permits. Of the 105, 72 were purse seine, 24 gillnet, and 9 beach seine. Urban local Natives received 89 limited entry permits representing 41.2 percent of the total. Of the 89, 64 were purse seine, 22 set gillnet and 3 beach seine. Alaskan Natives in the remaining residence categories obtained only 22 (10.1%) of the Kodiak area salmon permits.

As noted above, loss of limited entry permits has been experienced throughout the state by Alaskan Native populations. Table 28 reveals the disturbing incidence of this pattern in the Kodiak area. By the end of 1983, 18 permits had been lost by Alaskan Natives in the Kodiak purse seine fishery; this represents an 11.7 percent decline from the initial issuance level. In the beach seine fishery fully 50 percent of the initial

TABLE 27

DISTRIBUTION OF KODIAK AREA ALASKA NATIVE SALMON LIMITED ENTRY PERMIT OWNERSHIP AT INITIAL ISSUE

Residence/ Ethnicity	Permit Type							
	Purse Seine		Beach Seine		Set Gillnet		Total	
	No.	% Native	No.	% Native	No.	% Native	No.	% Native
Rural Local								
Native	72	46.7%	9	75%	24	48%	105	48.6%
Other	4		2		18		24	
Sum	76		11		42		129	
Rural Nonlocal								
Native	7	4.5%	0	0%	0	0%	7	3.2%
Other	7		2		2		11	
Sum	14		2		2		18	
Urban Local								
Native	64	41.6%	3	25%	22	44%	89	41.2%
Other	95		16		56		167	
Sum	159		19		78		256	
Urban Nonlocal								
Native	5	3.2%	0	0%	1	2%	6	1.0%
Other	15		1		13		29	
Sum	20		1		14		35	
Nonresident								
Native	6	3.9%	0	0%	3	6%	9	1.5%
Other	102		2		47		151	
Sum	108		2		50		160	
Total	377		35		186		598	
Native	154		12		50		216	
% Native	41%		34%		27%		36.1%	

Cultural Dynamics 1986

SOURCE: Kamali 1984:7,12

TABLE 28

CHANGES IN ALASKAN NATIVE OWNERSHIP OF KODIAK AREA SALMON LIMITED ENTRY PERMITS, 1975-1983

	Permit Type Native Loss (-) or Gain (+)			
Year	Purse Seine	Beach Seine	Set Gillnet	Total
1975	+2	0	-1	+1
1976	-2	-1	-2	-5
1977	-4	-1	-1	-6
1978	-2	-3	-3	-8
1979	-2	0	0	-2
1980	+3	+1	0	+4
1981	-2	-1	-5	-8
1982	-7	-1	-3	-11
1983	-4	0	+1	-3
Total	-18	-6	-14	-38
% Change From Initial Issuance	(-11.7 %)	(-50 %)	(-28 %)	(-17.6 %)

Source: Kamali 1984: 35-36

Cultural Dynamics 1986

issuance of 12 permits are now gone while in the set gillnet fishery the loss of 14 permits represents a 28 percent drop. The overall loss of 38 permits from the initial issuance of 216 represents a decline of 17.6 percent, substantially above statewide Native loss rate of 13.8 percent.

The combined total of permanent permits and interim permits (those issued to persons whose application for a permanent permit is still under review by the commission) sets the absolute limit on the amount of gear that can be fished. However, not all permits are used in any year. Table 29 indicates the actual number of units of purse seine, beach seine, and set gillnet gear used each year from 1975 to 1983. Substantial fluctuation is evident from year to year in the purse seine and beach seine fishery while the pattern in the set gillnet fishery has been one of continual increase as a higher and higher percentage of permits have been brought into use.

Permit Value

Values of limited entry permits are estimated by the Commercial Fisheries Entry Commission based on a mandatory survey completed by persons transferring permits. Data are based only on market transactions and do not include family transfers. Table 30 indicates the value of the three Kodiak

TABLE 29

NUMBER OF UNITS OF SALMON GEAR FISHED IN THE KODIAK AREA, 1975-1983

	GEAR TYPE			
Year	Purse Seine	Beach Seine	Set Gillnet	Total
1975	283	10	116	409
1976	341	18	145	504
1977	344	25	143	512
1978	375	31	158	564
1979	401	31	169	586
1980	372	33	169	574
1981	325	30	169	524
1982	338	28	169	535
1983	383	35	188	606

SOURCE: Dinneford 1984; ADFG 1983 Kodiak Area Annual Finfish Management Report

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TABLE 30

MEAN VALUES OF KODIAK AREA SALMON LIMITED ENTRY PERMITS, 1975-1983

	Permit Type		
Year	Purse Seine	Beach Seine	Set Gillnet
1975	$4,571	—	$5,380
1976	$9,736	—	$3,900
1977	$17,611	$15,000	$6,600
1978	$47,611	$29,250	$35,500
1979	$75,000	$35,500	$41,250
1980	$70,688	$42,625	$39,861
1981	$68,625	$42,429	$41,278
1982	$75,511	—	$39,817
1983	$69,903	$50,000	$57,033

(1) Based on CFEC survey.

Sources: Langdon 1980:65, Dinneford 1984:71, Kamali 1984:13.

salmon permits revealed by the survey where sufficient information was available for determination. Notable are the sharp rises in permit value from 1977 to 1978 and again from 1978 to 1979.

Salmon Vessel Characteristics

The size and characteristics of the Kodiak purse seine fleet from 1969 to 1980 are depicted in Table 31. Overall average length increased from about 34 to 36 feet with most of the increase occurring after 1976. New vessels appearing after that time are also larger in breadth, depth, gross and net tonnages and horsepower. Diesel engines and fiberglass hulls have been characteristic of almost all new vessels brought into the fishery since 1977.

Herring Limited Entry Permits

As of May, 1985, 41 permanent permits had been issued for the Kodiak purse seine sac roe herring fishery and 52 for the Kodiak gillnet sac roe herring fishery; many applications were under review. The Commission has established a maximum of 87 permits for the purse seine fishery and 108 for the gillnet fishery. No data on residency of permit owners, permit transfers, or permit prices are available.

Participation in the Unlimited Fisheries

Participation in the other regional fisheries was unlimited during the study period. The crab fisheries remained unlimited because throughout western Alaska fishermen expressed opposition to entry restrictions. Significant increase in the crab fisheries is clearly evident during the period, but it is extremely difficult to identify a precise picture of increase because of the fluctuations in the number of fishermen entering the king or tanner crab fishery each year and the fact that several captains may rotate on a single vessel during a given fishing season.

For purposes of analysis, Alaskan crab fleets are divided into classes of vessels equal to or less than 50 feet in length (small vessels) and greater than 50 feet in length (large vessels). Table 32 presents the available data on the characteristics of the small vessels fishing for king crab in the Kodiak area from 1969 to 1980. During this period, the fleet more than doubled growing from an average of 41 vessels in the first three years to an average of 111 during the last three years. After the mid-1970s, average length, gross and net tons and horsepower all increased and vessel age declined. Fiberglass hull vessels also replaced wooden vessels.

The large vessel fleet fishing Kodiak district waters for king crab also increased and changed significantly over the decade of the 1970s. As Table 33 shows, fleet size doubled from an average of 52 vessels in the first three years to an average of 105 in three years before 1980. Average

TABLE 31

CHARACTERISTICS OF KODIAK AREA PURSE SEINE VESSELS 1969-1980

YEAR	FLEET SIZE		REG. LENGTH	REG. BREADTH	REG. DEPTH	GROSS TONS	NET TONS	VESSEL AGE	HORSE POWER	DIESEL	WOOD HULLS	STEEL HULLS	GLASS HULLS	ALUM HULLS
1969	248	MEAN	33.7	12.54	5.04	16.86	11.89	15.25	130.80	.589	.886	.055	.055	.004
		SDEV	6.3	1.66	1.30	10.85	7.40	8.77	51.10					
		COUNT	235	204	204	211	237	231	227	236	236	236	236	236
1970	317	MEAN	33.8	12.68	5.15	17.72	11.98	14.97	137.95	.621	.857	.075	.061	.007
		SDEV	6.4	1.73	1.43	11.81	8.02	9.47	62.05					
		COUNT	291	242	242	251	246	287	274	293	293	293	293	293
1971	340	MEAN	33.3	12.57	5.12	16.96	11.50	16.07	131.65	.627	.851	.057	.089	.003
		SDEV	6.8	1.48	1.28	9.62	6.82	10.31	49.17					
		COUNT	315	257	257	267	318	307	293	316	316	316	316	316
1972	369	MEAN	33.3	12.62	5.11	16.67	11.51	14.48	140.92	.675	.784	.057	.149	.006
		SDEV	6.2	1.54	1.26	9.46	6.65	10.05	65.14					
		COUNT	347	288	288	302	348	342	328	348	348	348	348	348
1973	291	MEAN	33.5	12.63	5.11	16.60	11.67	15.57	134.50	.720	.799	.047	.151	.004
		SDEV	5.8	1.49	1.30	9.65	6.73	9.80	53.73					
		COUNT	278	234	234	246	278	277	269	279	279	279	279	279
1974	253	MEAN	33.7	12.73	5.19	17.16	11.33	15.34	138.55	.774	.749	.053	.193	.004
		SDEV	5.6	1.57	1.33	10.18	7.10	10.20	55.56					
		COUNT	242	204	204	212	245	242	234	243	243	243	243	243
1975	282	MEAN	33.9	12.83	5.21	17.43	12.20	15.35	147.34	.768	.722	.055	.223	.000
		SDEV	5.7	1.65	1.34	10.71	7.54	9.97	70.67					
		COUNT	274	230	230	242	274	271	263	272	273	273	273	273
1976	336	MEAN	34.9	13.04	5.39	19.15	13.18	16.79	150.68	.817	.701	.071	.228	.000
		SDEV	6.4	1.78	1.42	12.28	8.38	10.95	71.39					
		COUNT	324	276	276	288	325	322	314	323	324	324	324	324
1977	340	MEAN	34.8	12.95	5.34	18.47	12.99	16.28	151.72	.849	.651	.063	.283	.003
		SDEV	5.8	1.58	1.34	10.73	7.56	11.61	71.70					
		COUNT	332	289	289	300	333	330	324	332	332	332	332	332
1978	374	MEAN	35.0	13.07	5.47	19.17	13.90	14.34	165.79	.941	.529	.067	.390	.013
		SDEV	5.6	1.63	1.36	11.30	8.00	11.66	85.83					
		COUNT	373	329	329	344	367	372	372	374	374	374	374	374
1979	387	MEAN	35.5	13.20	5.54	20.03	14.73	13.61	174.80	.951	.478	.057	.447	.018
		SDEV	5.8	1.63	1.38	11.52	8.07	12.21	84.88					
		COUNT	387	347	347	359	377	356	384	387	387	387	387	387
1980	382	MEAN	36.3	13.33	5.62	21.22	15.81	13.13	188.92	.955	.404	.068	.512	.024
		SDEV	5.9	1.70	1.36	12.29	8.88	11.97	93.72					
		COUNT	382	334	334	361	372	381	373	382	381	381	381	381

Fleet size = number of units of gear.
Length, breadth and depth in feet.
Age in years.

SOURCE: CFEC 1982: 75

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TABLE 32

CHARACTERISTICS OF KODIAK AREA KING CRAB VESSELS
50 FEET AND UNDER, 1969-1980

YEAR	FLEET SIZE		REG. LENGTH	REG. BREADTH	REG. DEPTH	GROSS TONS	NET TONS	VESSEL AGE	HORSE POWER	DIESEL	WOOD HULLS	STEEL HULLS	GLASS HULLS	ALUM HULLS
1969	53	MEAN	39.8	14.22	6.33	30.22	20.88	11.80	160.20	.804	.686	.294	.020	.000
		SDEV	7.9	2.43	1.91	18.49	12.43	7.99	76.66					
		COUNT	51	49	49	49	50	51	51	51	51	51	51	51
1970	39	MEAN	39.9	14.14	6.53	30.47	20.50	12.30	171.56	.784	.622	.351	.027	.000
		SDEV	8.0	2.40	1.89	17.70	12.26	7.89	81.12					
		COUNT	37	36	36	36	38	37	36	37	37	37	37	37
1971	32	MEAN	41.3	14.50	6.69	33.06	23.06	13.50	185.34	.813	.656	.344	.000	.000
		SDEV	7.5	2.55	1.79	18.16	12.22	7.79	84.69					
		COUNT	32	32	32	32	32	32	32	32	32	32	32	32
1972	36	MEAN	41.4	14.69	6.53	33.78	23.61	12.69	186.72	.861	.528	.389	.083	.000
		SDEV	7.4	2.71	1.96	19.34	13.06	8.58	87.06					
		COUNT	36	36	36	36	36	36	36	36	36	36	36	36
1973	55	MEAN	41.1	14.45	6.51	31.58	22.19	13.60	193.75	.887	.566	.340	.094	.000
		SDEV	7.0	2.45	1.85	17.81	11.95	9.52	91.15					
		COUNT	53	53	53	53	53	53	53	53	53	53	53	53
1974	80	MEAN	39.1	15.04	6.38	28.12	19.21	14.99	179.71	.816	.539	.316	.145	.000
		SDEV	7.4	2.53	1.83	18.14	12.49	10.66	91.09					
		COUNT	77	71	71	75	78	76	75	76	76	76	76	76
1975	81	MEAN	37.8	13.87	6.17	26.30	17.75	14.20	184.57	.810	.595	.266	.139	.000
		SDEV	7.6	2.53	1.84	18.40	12.66	10.10	111.84					
		COUNT	80	69	69	74	79	79	79	79	79	79	79	79
1976	104	MEAN	38.6	14.08	6.29	27.45	18.18	12.95	196.90	.848	.545	.273	.172	.010
		SDEV	7.5	2.44	1.86	18.63	12.90	10.16	107.79					
		COUNT	99	90	90	96	103	99	99	99	99	99	99	99
1977	96	MEAN	39.3	14.20	6.41	29.51	19.98	13.77	202.80	.874	.484	.284	.211	.021
		SDEV	7.4	2.52	1.83	18.84	13.03	11.70	112.72					
		COUNT	94	87	87	90	96	95	94	95	95	95	95	95
1978	107	MEAN	40.2	14.53	6.72	31.97	22.54	10.96	218.35	.972	.318	.280	.355	.047
		SDEV	6.6	2.50	1.79	19.34	13.43	10.87	105.32					
		COUNT	107	101	101	104	106	107	107	107	107	107	107	107
1979	127	MEAN	40.5	14.81	6.87	33.81	24.73	9.65	234.75	.961	.299	.307	.370	.024
		SDEV	7.3	2.52	1.85	20.21	15.17	10.34	104.89					
		COUNT	127	119	119	124	124	127	126	127	127	127	127	127
1980	100	MEAN	41.5	15.19	7.03	36.39	26.37	9.09	247.43	.960	.222	.303	.455	.010
		SDEV	7.1	2.46	1.76	19.75	13.90	9.88	112.42					
		COUNT	100	88	88	98	98	100	98	100	99	99	99	99

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SOURCE: CFEC 1982:199

TABLE 33

CHARACTERISTICS OF KODIAK KING CRAB VESSELS OVER 50 FEET, 1969-1980

YEAR	FLEET SIZE		REG. LENGTH	REG. BREADTH	REG. DEPTH	GROSS TONS	NET TONS	VESSEL AGE	HORSE POWER	DIESEL	WOOD HULLS	STEEL HULLS	GLASS HULLS	ALUM HULLS
1969	58	MEAN	78.3	22.09	9.23	132.7	91.29	27.65	340.19	1	.737	.263	.000	.000
		SDEV	19.5	4.61	1.44	84.44	54.58	14.80	262.62					
		COUNT	57	57	57	57	58	57	57	57	57	57	57	57
1970	55	MEAN	78.8	22.42	9.56	142.9	98.27	23.45	380.29	1	.600	.400	.000	.000
		SDEV	23.7	4.54	1.83	93.10	65.95	16.72	280.99					
		COUNT	55	55	55	55	55	55	55	55	55	55	55	55
1971	44	MEAN	79.0	22.80	9.55	145.3	97.75	25.07	366.05	1	.636	.364	.000	.000
		SDEV	20.1	4.39	1.59	89.96	57.88	15.40	287.91					
		COUNT	44	44	44	44	44	44	44	44	44	44	44	44
1972	50	MEAN	77.8	22.45	9.67	141.5	97.22	26.92	333.10	1	.653	.347	.000	.000
		SDEV	19.9	4.34	1.70	95.99	62.90	15.94	180.19					
		COUNT	49	49	49	49	50	48	49	49	49	49	49	49
1973	76	MEAN	80.1	22.71	9.72	139.7	94.58	25.15	394.95	1	.547	.453	.000	.000
		SDEV	22.8	4.41	1.73	87.44	57.17	17.84	273.70					
		COUNT	75	75	75	75	76	75	75	75	75	75	75	75
1974	81	MEAN	78.7	22.33	9.70	140.7	96.10	25.74	418.84	1	.481	.519	.000	.000
		SDEV	22.7	4.25	1.71	96.34	66.05	18.37	459.44					
		COUNT	81	81	81	81	81	81	81	81	81	81	81	81
1975	87	MEAN	78.9	22.87	10.14	142.3	98.20	19.56	435.64	1	.368	.632	.000	.000
		SDEV	19.6	3.91	1.77	77.61	52.26	18.37	233.60					
		COUNT	87	87	87	87	87	87	87	87	87	87	87	87
1976	87	MEAN	77.1	22.68	9.90	138.7	97.18	20.76	409.36	1	.402	.586	.000	.011
		SDEV	17.8	3.94	1.63	78.39	54.50	18.21	232.92					
		COUNT	87	87	87	87	87	87	87	87	87	87	87	87
1977	83	MEAN	76.1	22.99	9.89	136.6	97.16	21.60	408.39	1	.386	.602	.000	.012
		SDEV	13.5	3.54	1.63	61.83	43.64	18.58	222.12					
		COUNT	83	83	83	83	83	83	83	83	83	83	83	83
1978	103	MEAN	77.8	22.99	9.86	140.3	99.10	22.64	417.73	1	.369	.631	.000	.000
		SDEV	17.4	3.82	1.73	70.96	49.35	18.87	219.03					
		COUNT	103	103	103	103	103	103	103	103	103	103	103	103
1979	127	MEAN	80.1	23.64	10.22	147.6	104.9	19.89	487.80	1	.307	.677	.000	.016
		SDEV	18.9	4.02	1.70	65.12	51.68	18.87	259.18					
		COUNT	127	126	126	126	127	127	127	126	127	127	127	127
1980	86	MEAN	75.5	22.77	9.99	135	96.71	19.88	449.43	1	.291	.698	.000	.012
		SDEV	14.2	3.55	1.61	59.33	45.53	18.80	222.84					
		COUNT	86	84	84	85	86	86	86	85	86	86	86	86

SOURCE: CFEC 1982:205

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vessel length, gross and net tons did not change systematically, while the average age declined, the average horsepower increased substantially, and steel hulls were substituted for wooden ones (CFEC 1982:204).

Table 34 depicts changes in the number and composition of the Kodiak tanner crab fleet under 50 feet in length during the period from 1969 to 1980. Over that time, the fleet grew dramatically from an initial level of 38 vessels in 1969 to a peak of 114 vessels in 1979. The average number of vessels in the fleet more than doubled from 42 from 1969 to 1977 to 100 from 1978 to 1980. The major changes in vessel characteristics were an increase in horsepower in the late 1970s and replacement of wooden vessels by those with fiberglass hulls.

Changes in the large vessel (greater than 50 feet in length) Kodiak tanner crab fishery are provided in Table 35. The increases and changes in these vessels are nearly symmetrical to those of the under 50 foot vessels. The fleet more than doubled from an average of 37 vessels in the first three years to an average of 90 in the last three. The average vessel length, gross tons, and net tons were constant, but in the mid-1970s new steelhulled vessels with greater horsepower began entering the fishery.

By 1984, ADFG figures indicate that both fleets had peaked in earlier years, the king crab fleet in 1982 and the tanner crab fleet in 1983. The peak number of king crab vessels was 309 while 348 (164 small and 184 large vessels) participated in the tanner crab fishery. Later figures differentiating between small and large vessels in the king crab fishery were not available for this report.

Participation in the shrimp fishery has shrunk dramatically in response to the decline of the resource. By 1984 only 13 vessels remained in the fishery, down from a peak of 75 in 1975.

Recently effort has shifted to sablefish and groundfish exploitation in an attempt to make up for losses from the king crab fishery.

Value of Commercial Fisheries to Fishermen

Total earnings of the fisheries resources of the Kodiak region for the period from 1975 to 1983 are presented in Table 36. The figures represent all domestically caught and landed species in the waters of the two areas, but do not include joint venture groundfish catches delivered to foreign processors and foreign catches. The figures are in current, non-inflation adjusted dollars.

Shellfish have been the major source of value over the period, ranging from a high of 65.8 percent in 1982 to a low of 46.4 percent in 1978. From 1975 to 1982, king crab was the most valuable of the three crab species in every year accept 1979 when tanner crab value was slightly higher. This was true despite the fact that harvest levels over the time period were less than half what they were in the decade from 1960-1970. Peak dollar earnings

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TABLE 34

CHARACTERISTICS OF KODIAK TANNER CRAB VESSELS
50 FEET AND UNDER, 1969-1980

YEAR	FLEET SIZE		REG. LENGTH	REG. BREADTH	REG. DEPTH	GROSS TONS	NET TONS	VESSEL AGE	HORSE POWER	DIESEL	WOOD HULLS	STEEL HULLS	GLASS HULLS	ALUM HULLS
1969	38	MEAN	41.3	14.64	6.67	33.44	23.25	11.32	177.81	.892	.622	.378	.000	.000
		SDEV	8.0	2.46	1.93	18.64	12.59	10.53	76.28					
		COUNT	37	36	36	36	36	37	37	37	37	37	37	37
1970	28	MEAN	43.6	14.96	7.12	37.12	24.96	11.27	193.92	.923	.538	.462	.000	.000
		SDEV	6.7	2.41	1.73	17.50	12.34	7.58	86.54					
		COUNT	26	26	26	26	27	26	26	26	26	26	26	26
1971	24	MEAN	43.7	15.04	7.17	37.75	25.92	12.17	193.42	.958	.583	.417	.000	.000
		SDEV	6.8	2.37	1.69	17.21	11.85	7.61	88.60					
		COUNT	24	24	24	24	24	24	24	24	24	24	24	24
1972	33	MEAN	41.3	14.55	6.55	32.70	22.82	13.73	193.30	.818	.606	.333	.061	.000
		SDEV	7.6	2.56	1.70	17.36	11.76	8.79	82.64					
		COUNT	33	33	33	33	33	33	33	33	33	33	33	33
1973	55	MEAN	40.2	14.32	6.47	30.51	21.47	12.77	182.15	.906	.585	.283	.113	.000
		SDEV	7.3	2.42	1.85	17.85	11.95	9.05	79.99					
		COUNT	54	53	53	53	53	53	53	53	53	53	53	53
1974	55	MEAN	40.1	14.08	6.35	29.25	20.15	15.87	174.43	.887	.604	.264	.113	.000
		SDEV	7.3	2.42	1.90	17.60	12.11	11.00	76.93					
		COUNT	54	52	52	52	54	53	53	53	53	53	53	53
1975	39	MEAN	40.5	14.39	6.64	31.76	22.21	13.55	212.92	.868	.526	.342	.132	.000
		SDEV	7.7	2.66	1.74	18.84	12.69	9.68	132.93					
		COUNT	39	36	36	37	38	38	37	38	38	38	38	38
1976	49	MEAN	40.4	14.36	6.55	31.35	22.21	13.75	211.50	.896	.542	.333	.125	.000
		SDEV	7.4	2.68	1.83	19.88	13.32	9.93	125.07					
		COUNT	49	47	47	48	48	48	48	48	48	48	48	48
1977	57	MEAN	41.0	14.55	6.61	33.20	22.77	14.79	217.16	.877	.526	.351	.123	.000
		SDEV	7.2	2.68	1.91	19.89	13.70	11.08	120.80					
		COUNT	57	56	56	56	57	57	57	57	57	57	57	57
1978	77	MEAN	39.8	14.27	6.53	30.37	21.36	13.22	208.82	.974	.403	.312	.273	.013
		SDEV	6.7	2.48	1.77	18.75	12.74	11.13	84.84					
		COUNT	77	74	74	75	77	77	77	77	77	77	77	77
1979	114	MEAN	40.4	14.70	6.72	31.94	23.12	10.07	229.77	.991	.289	.263	.412	.035
		SDEV	6.4	2.42	1.82	19.39	13.40	10.75	107.80					
		COUNT	114	107	107	113	113	113	114	114	114	114	114	114
1980	110	MEAN	41.0	14.95	6.53	34.08	24.74	10.35	238.47	.991	.255	.291	.436	.018
		SDEV	6.3	2.42	1.70	19.37	13.75	10.79	106.26					
		COUNT	110	104	104	108	109	110	110	110	110	110	110	110

Cultural Dynamics

SOURCE: CFEC 1982:211

(-7)

TABLE 35

CHARACTERISTICS OF KODIAK TANNER CRAB VESSELS OVER 50 FEET, 1969-1980

YEAR	FLEET SIZE		REG. LENGTH	REG. BREADTH	REG. DEPTH	GROSS TONS	NET TONS	VESSEL AGE	HORSE POWER	DIESEL	WOOD HULLS	STEEL HULLS	GLASS HULLS	ALUM HULLS
1969	49	MEAN	77.4	21.76	9.10	125.5	86.27	27.90	338.69	1	.776	.224	.000	.000
		SDEV	17.1	4.52	1.21	66.29	47.13	14.27	276.92					
		COUNT	49	49	49	49	49	49	49	49	49	49	49	49
1970	36	MEAN	77.8	22.36	9.22	137.8	97.25	26.19	339.06	1	.722	.278	.000	.000
		SDEV	17.9	4.39	1.27	70.77	51.60	15.13	300.95					
		COUNT	36	36	36	36	36	36	36	36	36	36	36	36
1971	27	MEAN	76.2	22.11	9.15	132.7	96.00	26.67	360.96	1	.704	.296	.000	.000
		SDEV	18.5	4.66	1.51	72.08	53.72	16.79	338.62					
		COUNT	27	27	27	27	27	27	27	27	27	27	27	27
1972	29	MEAN	72.8	21.41	8.97	114.3	78.72	30.07	231.24	1	.724	.276	.000	.000
		SDEV	12.1	4.56	1.32	63.82	45.47	17.84	156.25					
		COUNT	29	29	29	29	29	29	29	29	29	29	29	29
1973	69	MEAN	77.7	22.49	9.78	140.7	95.93	25.31	352.59	1	.574	.426	.000	.000
		SDEV	17.6	4.01	1.62	85.04	56.36	17.90	178.13					
		COUNT	68	68	68	68	69	68	68	68	68	68	68	68
1974	69	MEAN	78.8	22.94	9.84	140	96.71	23.74	393.20	1	.478	.522	.000	.000
		SDEV	20.2	4.49	1.68	73.54	52.63	18.49	219.67					
		COUNT	69	69	69	69	69	69	69	69	69	69	69	69
1975	66	MEAN	75.7	22.73	10.15	132.6	93.71	15.95	453.80	1	.303	.697	.000	.000
		SDEV	12.7	3.81	1.62	49.43	39.16	18.13	234.41					
		COUNT	66	66	66	66	66	66	66	66	66	66	66	66
1976	58	MEAN	77.0	22.66	10.05	138.9	96.64	20.81	422.00	1	.328	.672	.000	.000
		SDEV	16.0	3.95	1.59	75.39	49.78	19.70	226.94					
		COUNT	58	58	58	58	58	58	58	58	58	58	58	58
1977	45	MEAN	71.9	22.36	10.11	123.8	86.09	17.87	411.22	1	.289	.689	.000	.022
		SDEV	13.4	3.68	1.48	45.97	36.71	17.55	228.27					
		COUNT	45	45	45	45	45	45	45	45	45	45	45	45
1978	71	MEAN	78.2	23.03	9.94	138.2	97.55	22.70	418.99	1	.338	.662	.000	.000
		SDEV	17.5	3.85	1.80	66.42	45.19	19.05	223.31					
		COUNT	71	71	71	71	71	71	71	71	71	71	71	71
1979	102	MEAN	79.5	23.25	10.04	142.8	100.9	21.77	475.61	1	.333	.657	.000	.010
		SDEV	19.3	3.95	1.70	66.04	47.92	19.08	260.63					
		COUNT	102	101	101	101	102	102	102	102	102	102	102	102
1980	97	MEAN	79.9	23.57	10.13	147	104.9	20.45	481.85	1	.278	.722	.000	.000
		SDEV	19.8	3.85	1.87	69.44	49.71	18.93	255.15					
		COUNT	97	96	96	96	97	97	97	96	97	97	97	97

6-8

SOURCE: CFEC 1982:217

TABLE 36

TOTAL EX-VESSEL VALUE OF KODIAK REGION FISHERIES HARVESTED BY U.S. FISHERMEN BY SPECIES 1975-1983

(Thousands of Dollars)

Species					Year				
	1975	1976	1977	1978	1979	1980	1981	1982	1983
Salmon	3830.5	16966.9	19721.3	32325.2	24083.3	29612.6	32339.1	16230.4	14530.0
% of Total	12.8%	30.6%	37.0%	43.4%	37.6%	42.7%	30.4%	18.2%	28.8%
King crab	15900.0	24600.0	18100.0	19200.0	13900.0	21500.0	48500.0	32700.0	339.0
% of Total	53.2%	44.3%	34.0%	25.8%	21.7%	31.0%	45.7%	36.6%	.7%
Tanner crab	2320.5	5467.4	6837.6	14311.0	16045.6	10243.1	7636.6	22697.1	23658.8
% of Total	7.8%	9.9%	12.8%	19.2%	25.1%	14.8%	7.2%	25.4%	46.9%
Dungeness crab	390.0	13.0	34.0	1022.0	943.0	905.0	3897.0	3410.0	4989.0
% of Total	1.3%	-	.1%	1.4%	1.5%	1.3%	3.7%	3.8%	9.9%
Shrimp	4656.3	3926.9	4671.2	3433.2	3383.5	2894.3	7859.3	5160.1	2805.6
% of Total	15.6%	7.1%	8.8%	4.6%	5.3%	4.2%	7.4%	5.8%	5.6%
Herring	2.6	46.8	289.7	792.3	2657.1	1658.4	1533.4	984.0	1730.2
% of Total	-	.1%	.5%	1.1%	4.1%	2.4%	1.4%	1.1%	3.4%
Halibut	2354.1	4203.1	3458.6	3113.6	2180.2	818.8	2217.7	5314.6	9031.9
% of Total	7.9%	7.6%	6.9%	4.2%	3.4%	1.2%	2.1%	6.0%	17.9%
Scallops	412.0	119.0	0	0	69.0	1275.0	1698.0	1416.0	739.0
% of Total	1.4%	.2%	0%	0%	.1%	1.8%	1.6%	1.6%	1.5%
Groundfish	31.0	125.0	160.0	343.0	763.0	500.0	550.0	1324.0	1612.0
% of Total	.1%	.2%	.3%	.5%	1.2%	.7%	.5%	1.5%	3.2%
TOTAL	29897.0	55468.1	53272.4	74540.3	64024.7	69407.2	106231.1	89276.1	50403.6
Kodiak Fishermen's Area K Total (except confidential earnings from Kodiak area)	15781.1	25937.6	37373.9	47955.3	48354.9	52981.4	69949.5	66285.3	27492.4[1]
% of Total	52.8%	46.8%	70.2%	64.3%	75.5%	77.2%	67.2%	74.2%	54.5%

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[1] 1983 halibut earnings by Kodiak fishermen from area K not included.

SOURCE: CFEC

from king crab were obtained in 1981 with $48.5 million but this fell to only $339,000 just two years later. The proportional contribution of king crab to total value was highest in 1975 at 53.2 percent and lowest in 1983 at .7 percent.

Tanner crab were second to king crab in ex-vessel value except for 1979 and 1983. Both greatest value and greatest relative contribution to regional earnings were reached for Tanner crab in 1983--$23.7 million and 46.9 percent. Lowest earnings were obtained in 1975 and lowest relative contribution in 1981.

Dungeness crab were less than 2 percent of regional total fisheries value from 1975 to 1980, never topping $1 million during that time. Their importance began to rise in 1981 and in 1983, with a value of almost $5 million, dungeness crab provided 9.9 percent of Kodiak ex-vessel gross earnings.

Salmon provided a little over 31% of regional value over the study period. Maximum ex-vessel earnings were obtained in 1981 when the salmon fishery was worth $32.3 million. Peak contribution occurred in 1978 when salmon provided 43.4 percent of regional value. Nadirs were reached in 1975 for both total earnings ($3.8 million) and percentage contribution (12.8%).

Shrimp harvests were at their peak between 1970 and 1973. Over the study period the contribution of shrimp to total regional fisheries value generally declined. Highest earnings were obtained in 1981 when they were $7.9 million; by 1983, however, they had plummeted to only $2.8 million. Proportionately, only in 1980 when they provided only 4.2 percent of value, did shrimp make a contribution to Kodiak fisheries lower than 1983.

Halibut have fluctuated widely in earnings and percent contribution to the Kodiak region. After providing from 4-8 percent of regional fisheries value from 1975 to 1979, the nadir of halibut value and contribution was reached in 1980 when $818,000 accounted for only 2.2 percent of regional earnings. However, by 1983 the decline of other fisheries and the increase in halibut stocks had pushed halibut earnings to its highest level during the study period. In 1984, halibut's (17.9 percent) proportion was expected to exceed 20 percent of the total value of fisheries harvested in the Kodiak region.

Herring, especially the sac roe herring fishery, has made a small but relatively steady contribution to regional earnings. Its peak was reached in 1979 when prices and catch levels were at their highest. Total ex-vessel earnings of nearly $2.7 million dollars amounted to 4.1 percent of regional commercial fisheries value.

The domestic groundfisheries (Table 36 does not include joint venture or foreign values) provided only a small percentage of regional value during the study period although sharp increases occurred in 1982 and 1983. The $1.6 million earned in 1983 was the highest recorded, but still amounted to only 3.2% of regional ex-vessel value. Additional earnings from Kodiak area fisheries resources are also realized by domestic fishermen selling to foreign processors (joint ventures), foreign fishermen, and the U.S. government from fees applied to foreign catches.

Distribution of Total Value

The ex-vessel value elaborated above was distributed among fishermen in a variety of patterns. This section examines distributional patterns by residency and gear type for the salmon, king crab, and tanner crab fisheries. Data provided by the Commercial Fisheries Entry Commission on the earnings of Kodiak region resident fishermen is divided into Kodiak city fishermen and Kodiak village fishermen. The value of Kodiak regional fisheries not taken by either Kodiak city or Kodiak village fishermen can be identified as the remaining difference when the value of Kodiak region fishermen is deducted from the total value of the resource harvested. Although fishermen who reside in the Kodiak region of the study area fish intensively in local waters, they also travel to other areas of the state to participate in commercial fisheries. Data provided by the CFEC is organized by management area, allowing determination of the proportion of the fishermen's earnings taken from Kodiak waters as well as the proportion of regional value taken by Kodiak resident fishermen.

Within the salmon fisheries, the purse seine fishery takes the preponderance of catch and of total regional salmon ex-vessel value, ranging from 66 to 85 percent of value and averaging about 75 percent. Table 29 indicates the number of units of each gear type operating from 1975 to 1983; Table 37 provides the Kodiak commercial fisheries division's (ADF&G) estimate of average ex-vessel earnings per unit in each fishery. Note that this estimate often differs from the CFEC estimates which are based on actual ex-vessel fish ticket reports as opposed to ADF&G figures which use average area prices by species to estimate catch value.

The purse seine fishery is the only one of the three salmon fisheries in which there is a substantial component of village participation. As we have seen, both the set gillnet and beach seine fisheries in the Kodiak villages have fallen to such low levels of participation that data for these fisheries in the villages is confidential. Thus, the purse seine fishery is the only fishery amenable to an analysis of the distribution of earnings by residency.

The distribution of Kodiak purse seine ex-vessel earnings among different residency groupings of fishermen is displayed in Table 38. Kodiak city fishermen increased their absolute number in the fishery from 142 in 1975 to 199 in 1980 and then fell back to 180 in 1983. Despite this absolute increase, the percentage of Kodiak city fishermen remained right around 50 percent. Throughout the study period, the Kodiak city fishermen garnered the largest share of the value, which would be expected since they controlled the greatest number of limited entry permits. However, despite their numbers, Kodiak city fishermen have not attained earnings proportionate to their numbers in the fishery. In fact, they exceeded the overall average gross earning in the Kodiak purse seine fishery reported by the CFEC in only one year, 1982, which was also the only year in which they attained greater than a 50 percent share of the fishery.

TABLE 37
ADF&G ESTIMATED MEAN GROSS EARNINGS OF KODIAK AREA SALMON GEAR TYPES
1970-1984
(Thousands of Dollars)

(Number of Fish)

Year	Catch	Total Value	Average Earnings Purse Seine	Average Earnings Beach Seine	Average Earnings Set Net
1970	13,949,000	$21,658,000	$41,880	$10,470	$21,083
1971	6,376,000	4,973,000	13,397	2,919	3,015
1972	3,890,000	3,909,000	9,233	647	1,451
1973	1,001,000	2,094,000	5,075	251	852
1974	3,323,000	4,808,000	15,993	4,406	4,828
1975	3,187,000	3,831,000	13,300	5,600	3,849
1976	12,484,000	16,976,000	43,017	11,035	14,481
1977	7,977,000	21,000,000	48,382	12,434	19,351
1978	16,942,000	32,000,000	72,158	15,731	25,495
1979	12,420,000	25,000,000	48,906	18,839	23,000
1980	19,157,000	31,000,000	69,117	7,710	21,578
1981	13,057,000	33,000,000	75,257	17,312	26,231
1982	10,892,000	16,230,000	31,868	10,549	30,554
1983	7,082,000	14,530,000	32,832	5,886	19,338
1984*	13,673,000	24,670,000	55,152	10,300	23,111
14 year Average	9,408,000	15,463,000	37,173	8,842	15,365

* Preliminary. Value for 1984 will be adjusted after Processors Annual Reports are summarized.

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SOURCE: ADFG, 1984c

TABLE 38

DISTRIBUTION OF KODIAK AREA PURSE SEINE EARNINGS BY RESIDENCY, 1975-1983

(thousands of dollars)

Residence of Fishermen

	Kodiak Villages					Kodiak (City)					Total Area		
Year	No. Fish-ermen	% of Total	Aver-age Gross	Total Value	% of Total Value	No. Fish-ermen	% of Total	Aver-age Gross	Total Value	% of Total Value	No. Fish-men[2]	Aver-age Gross	Total Value
1975	61	(16.0%)	$10.6	$646.6	(15.2%)	142	(50.3%)	$13.8	$1959.6	(46.1%)	282	$15.1	$4252.3
1976	66	(20.3%)	$42.7	$2818.2	(17.1%)	158	(48.6%)	$41.7	$6588.6	(40.0%)	325	$50.6	$16453.6
1977	66	(21.1%)	$35.6	$2349.6	(15.1%)	157	(50.3%)	$46.0	$7222.0	(46.4%)	342	$49.9	$15567.2
1978	66	(19.1%)	$49.0	$3234.0	(12.3%)	176	(51.0%)	$66.2	$11651.2	(44.4%)	345	$76.0	$26233.9
1979	70	(20.6%)	$37.8	$2646.0	(14.2%)	189	(55.6%)	$45.4	$8580.6	(46.1%)	340	$54.7	$18601.2
1980	74	(20.6%)	$46.9	$3470.6	(15.2%)	199	(55.3%)	$50.6	$10069.4	(44.2%)	360	$59.9	$22873.0
1981	72	(22.1%)	$60.9	$4384.8	(17.9%)	182	(56.0%)	$62.4	$11356.8	(46.4%)	325	$75.3	$24458.5
1982	61	(18.0%)	$20.3	$1238.3	(11.5%)	186	(55.0%)	$33.8	$6286.8	(58.4%)	338	$31.9	$10771.4
1983	77	(21.1%)	$16.8	$1293.6	(10.3%)	180	(49.2%)	$26.0	$4680.0	(39.9%)	366	$32.8	$12016.5

[1] Village total value computed by multiplying average gross of individual fishermen by the number of confidential fishermen then summing the confidential total with the individual total.

[2] Actually fished according the CFEC records.

SOURCE: CFEC

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The Kodiak village purse seine fishermen were able to increase their absolute rate of participation from 61 in 1975 to 77 in 1983. The village percentage in the fishery remained in a steady state at about 20 percent over the period. Similar to their urban neighbors, Kodiak village fishermen did not earn a share consistent with their numbers. In no year did village purse seiners exceed the overall average gross earnings, and in only one year (1976) did the village average gross exceed the Kodiak city figure. Throughout most of the period, average gross earnings of Kodiak village fishermen were 10-25 percent lower than city fishermen; however, the gap widened noticeably in 1982 and remained in 1983 when village fishermen's average earnings amounted to only about 60 percent of those of city fishermen. It is not known if this downward trend continued in 1984 or not.

If both Kodiak city and Kodiak village fishermen are producing average earnings below the overall average for the entire salmon purse seine fishery, it stands to reason that the other residency groups, particularly the nonresident group, have average gross earnings substantially above the mean for the entire fishery. Larson reports data that support this finding. Based on a survey for 1979, 16 Kodiak resident fishermen reported average gross earnings in the salmon purse seine fishery of $54,471 compared to $64,306 reported by 18 non-Alaskan fishermen and $51,106 by non-Kodiak Alaskan fishermen (Larson 1980:14). These nonlocal groups comprise roughly 30 percent of the participants but appear to take 35-40 percent of the purse seine earnings each year. Based on Larson's data, it would appear that non-Alaskan fishermen have substantially higher average gross earnings in the fishery than Alaskans.

In the king crab and tanner crab fisheries, Kodiak city fishermen appear to fare much better than they do in the salmon purse seine fishery. Table 39 provides a breakout of Kodiak district king crab earnings by residency group and vessel size. Some qualifications should be noted in the data since they are organized slightly differently. The data for Kodiak villages and Kodiak city are based on fishermen while the total area data is based on vessels. If a single person ran a single, same vessel for the entire season, then the numbers will be the same. If, however, as is sometimes the case particularly with larger vessels, more than one person ran a vessel and had earnings recorded, then there will be discrepancies between the two figures. Another set of discrepancies that appear after 1981 is that ADF&G estimates rather than CFEC numbers are used for the total value of the fishery.

Despite these complications, several findings are apparent. First, Kodiak city fishermen took from Kodiak area waters a much higher percentage of king crab earnings than they did of salmon earnings. During the study period, 75.5 percent in 1975 was the lowest percentage; a steady increase to 88 percent of value was apparent to 1980. The Kodiak city share exceeded 80 percent in the last two big seasons.

Village fishermen, on the other hand, did significantly worse in the king crab fishery than in the salmon fishery. The largest village share of the

TABLE 39

DISTRIBUTION OF KODIAK AREA KING CRAB EX-VESSEL EARNINGS BY RESIDENCE AND VESSEL SIZE, 1975-1983 (1)

Year And Vessel Size		Kodiak Villages				Kodiak (City)				Total Area			
		# Of Fishermen	Average Gross (Thousands)	Total Value (Thousands)	% Of Total Value	# Of Fishermen By Vessel Size	Average Gross (Thousands)	Total Value (Thousands)	% Of Total Value	# Of Fishermen By Vessel Size	Average Gross (Thousands)	Total Value (Millions)	% Of Total Value
1975	50' Or Less	14	$10.4	$145.6	(6.9%)	70	$24.2	$1694.0	(80.6%)	81	$26.0	$2.1	(19.7%)
	Over 50'	—	—	—	—	122	$52.0	$6344	(74.1%)	87	$98.3	$8.56	(80.3%)
	Total	14	$10.4	$145.6	(.9%)	192	$41.9	$8045	(75.5%)	168	$63.5	$10.66	
1976	50' Or Less	15	$20.8	$312.0	(10.0%)	88	$26.6	$2341	(75.3%)	104	$29.9	$3.11	(25.0%)
	Over 50'	—	—	—	—	77	$100.8	$7762	(83.3%)	87	$107.1	$7.32	(75.0%)
	Total	15	$20.8	$312.0	(2.5%)	165	$61.2	$10103	(81.3%)	191	$65.0	$12.43	
1977	50' Or Less	10	$14.9	$149.0	(4.7%)	105	$25.7	$2698	(85.4%)	96	$32.9	$3.16	(17.4%)
	Over 50'	—	—	—	—	95	$124.8	$11856	(79.2%)	83	$180.4	$14.97	(82.6%)
	Total	10	$14.9	$149.0	(.8%)	200	$72.8	$14554	(80.3%)	179	$101.3	$18.13	
1978	50' Or Less	9	$7.9	$71.1	(2.1%)	91	$27.3	$2484	(72.4%)	107	$32.1	$3.43	(17.5%)
	Over 50'	NA	NA	$863.1	(4.4%)	108	$124.9	$13489	(83.4%)	103	$157	$16.17	(82.5%)
	Total	9	$7.9	$734.2	(4.8%)	199	$80.3	$15973	(81.5%)	210	$93.3	$19.6	
1979	50' Or Less	17	$10.8	$183.6	(4.8%)	101	$25.1	$2535	(66.4%)	127	$30.1	$3.82	(20.6%)
	Over 50'	NA	NA	$599.5	(3.7%)	160	$79.1	$12656	(85.7%)	127	$116.2	$14.76	(79.4%)
	Total	17	$10.8	$783.1	(4.2%)	261	$58.2	$15191	(81.8%)	254	$73.1	$18.58	
1980	50' Or Less	13	$25.1	$326.3	(5.5%)	45	$58.8	$2646	(44.9%)	100	$58.9	$5.89	(26.3%)
	Over 50'	NA	NA	$242.6	(1.1%)	135	$126.4	$17064	(103%)	86	$191.9	$16.5	(73.7%)
	Total	13	$25.1	$568.9	(2.5%)	180	$185.2	$19710	(88%)	186	$120.4	$22.4	
1981	50' Or Less	12	$25.0	$300.0	(.6%)	92	$74.6	$6863	(14.1%)	NA	NA	NA	NA
	Over 50'	NA	NA	$1267.6	(2.6%)	167	$193.5	$32314	(66.6%)	NA	NA	NA	NA
	Total	12	$25.0	$1567.6	(3.2%)	259	$151.3	$39178	(80.8%)	246	$197.2	$48.5	
1982	50' Or Less	21	$26.1	$548.1	(1.7%)	99	$40.2	$3980	(12.2%)	NA	NA	NA	NA
	Over 50'	NA	NA	$436.2	(1.3%)	189	$126.8	$23965	(73.3%)	NA	NA	NA	NA
	Total	21	$26.1	$984.3	(3.0%)	288	$97.0	$27945	(85.5%)	309	$105.8	$32.7	
1983	50' Or Less	—	—	—	—	—	—	—	—	NA	NA	NA	NA
	Over 50'	—	—	—	—	7	$14.1	$99	(33.3%)	NA	NA	NA	NA
	Total	—	—	—	—	7	$14.1	$99	(33.3%)	12	$25.0	$.3	

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(1) Total area figures from 1975 to 1980 are from CFEC (1982). Total area figures for 1981 to 1983 are from the ADF&G 1984 Westward Region Shellfish Annual Report.

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king crab fishery was taken in 1978 at 4.8 percent of total value. The lower performance of village fishermen is also apparent by comparing average earnings of the small vessel fishermen. In no year did village fishermen's average gross exceed either that of Kodiak city small boat fishermen or the total small boat fleet. In most years, the village average was less than half of the Kodiak city average, indicating a significant disparity between the two groups of fishermen.

The number of large and small vessels and their relative share of the king crab fishery is also found in Table 39. The peak in the number of small vessels was reached for the total fishery in 1979 while the number of fishermen on larger vessels continued to increase through 1982. Overall the number of fishermen using larger vessels had grown to twice as many as those using small vessels by 1983 despite virtual parity in the early years of the study period. The relative distribution of total catch between the two vessel classes fluctuated around 80 percent for the big boats and 20 percent for the small vessels. Translated into per vessel average gross earnings, the larger vessels generally grossed from three to five times more than the small vessels.

It is noteworthy that beginning in 1978, larger vessels appear in use by village fishermen albeit as confidential records. The performance of the larger vessels from the villages is not regular in that they exceeded the small boat harvests by 400 percent in 1981 but fell below small vessel harvests in both 1980 and 1982.

Overall average gross earnings for the entire fleet peaked in 1981 at $197,200. For small vessels, the highest average gross from 1975 to 1980 was attained in 1980 with $58,900. Data from Kodiak city alone, however, indicate an average gross of $74,600 for small vessels in 1981. The large vessels peak earnings were also apparently reached in 1981; Kodiak city fishermen on large vessels averaged $193,500 in that year.

Comparative information on the tanner crab fleet and fishery is presented in Table 40. The discrepancies noted in the king crab discussion apply to the tanner crab fishery as well. For 1981, the dilemma is even greater because the data for Kodiak city fishermen alone exceed the total value of the fishery estimated by ADF&G thus making proportional analysis by residency and vessel size impossible.

The number of vessels fishing tanner crab increase more dramatically than king crab vessels over the study period. The peak of 348 reached in 1983 was more than three times greater than the 1975 figure of 105 vessels. The increase appears to have been slightly greater for the larger vessels than for the smaller ones. Unlike the king crab fishery, larger vessels have outnumbered smaller vessels in the tanner crab fishery from the start and continued to maintain the margin over the study period. It appears that

TABLE 40
DISTRIBUTION OF KODIAK AREA TANNER CRAB EX-VESSEL EARNINGS BY RESIDENCE AND VESSEL SIZE, 1975-1983 (1)

Year And Vessel Size		Kodiak Villages				Kodiak (City)				Total Area			
		# Of Fishermen	Average Gross (Thousands)	Total Value (Thousands)	% Of Total Value	# Of Fishermen By Vessel Size	Average Gross (Thousands)	Total Value (Thousands)	% Of Total Value	# Of Fishermen By Vessel Size	Average Gross (Thousands)	Total Value (Millions)	% Of Total Value
1975	50' Or Less	4	$1.8	$7.2	(1.1%)	39	$16.4	$640	(94.1%)	39	$17.4	$.68	(22.0%)
	Over 50'	—	—	—	—	75	$22.5	$1687	(70%)	66	$36.5	$2.41	(78%)
	Total	4	$1.8	$7.2	(.2%)	114	$20.4	$2327	(75.3%)	105	$29.4	$3.09	
1976	50' Or Less	6	$12.7	$76.2	(7.3%)	44	$20.0	$880	(84.6%)	49	$21.2	$1.04	(20.8)
	Over 50'	—	—	—	—	60	$61.0	$3660	(92.2%)	58	$68.4	$3.97	(79.2%)
	Total	6	$12.7	$76.2	(1.5%)	104	$43.7	$4540	(90.6%)	107	$46.8	$5.01	
1977	50' Or Less	11	$30.8	$338.8	(12.1%)	57	$41.2	$2348	(84.2%)	57	$48.9	$2.79	(30.9%)
	Over 50'	—	—	—	—	59	$100.4	$5924	(94.9%)	45	$138.7	$11.63	(69.1%)
	Total	11	$30.8	$338.8	(3.7%)	116	$71.3	$8272	(91.6%)	102	$88.5	$9.03	
1978	50' Or Less	5	$18.2	$91.0	(1.8%)	72	$55.7	$4010	(79.1%)	77	$65.8	$5.07	(30.4%)
	Over 50'	NA	NA	$315.3	(1.9%)	92	$118.1	$10865	(93.4%)	71	$163.8	$11.63	(69.6%)
	Total	5	$18.2	$404.3	(2.4%)	164	$90.7	$14876	(89.1%)	148	$112.8	$16.7	
1979	50' Or Less	8	$19.9	$159.2	(2.6%)	85	$50.4	$4284	(70.9%)	114	$53.0	$6.04	(30.8%)
	Over 50'	NA	NA	$602.9	(3.1%)	105	$113.8	$11949	(88%)	102	$133.1	$13.58	(69.2%)
	Total	8	$19.9	$762.2	(3.9%)	190	$85.4	$162.33	(82.7%)	216	$90.8	$19.62	
1980	50' Or Less	10	$8.9	$89.0	(2.2%)	52	$41.1	$2137	(52.6%)	110	$36.9	$4.06	(31.3%)
	Over 50'	NA	NA	$402.6	(3.1%)	143	$66.6	$9524	(106.8%)	97	$92.0	$8.92	(68.7%)
	Total	10	$8.9	$491.6	(3.8%)	195	$59.8	$11661	(89.8%)	207	$62.7	$12.98	
1981	50' Or Less	5	$9.5	$47.5	(?)	66	$25.0	$1650	(?)	NA	NA	NA	NA
	Over 50'	NA	NA	$250.2	(?)	115	$59.8	$6877	(?)	NA	NA	NA	NA
	Total	5	$9.5	$297.7	(?)	181	$47.1	$8527	(?)	188	$40.6	$7.64	
1982	50' Or Less	9	$30.8	$277.2	(1.2%)	61	$44.6	$2721	(12.0%)	NA	NA	NA	NA
	Over 50'	NA	NA	$738.3	(3.2%)	134	$145.6	$19510	(85.9%)	NA	NA	NA	NA
	Total	9	$30.8	$1015.5	(4.5%)	195	$114.0	$22231	(97.9%)	221	$102.7	$22.7	
1983	50' Or Less	20	$11.0	$220.0	(.9%)	96	$28.6	$2746	(11.6%)	NA	NA	NA	NA
	Over 50'	NA	NA	$310.6	(1.3%)	145	$82.9	$12020	(50.8%)	NA	NA	NA	NA
	Total	20	$11.0	$530.6	(2.2%)	241	$61.3	$14766	(62.4%)	348	$68.0	$23.66	

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(1) Total area figures from 1975 to 1980 are from CFEC (1982). Total area figures for 1981 to 1983 are from the ADF&G 1984 Westward Region Shellfish Annual Report.

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Kodiak region fishermen took an even higher proportion of tanner than they did of king crab. From 1976 through 1980, they averaged over 90 percent of the total value. Of the total, Kodiak city fishermen took the largest share, averaging over 90 percent by themselves. Village fishermen never attained more than 4.5 percent, displaying a pattern of harvest similar to that found for the king crab fishery. Small boat village fishermen appear to have done a little better in tanner compared to Kodiak city small boat fishermen than they did in king crab. Nevertheless, in most years the village average gross was less than half of that of small boat fishermen in Kodiak city.

One important feature of the tanner crab data is the sharp drop in the Kodiak city fishermen's share of the catch in 1983 apparently from an influx of larger vessels, presumably from the Bering Sea king crab fishery. The relative success of small and large vessels does not show quite the magnitude of differential found for king crab, but is still quite substantial. The peak average tanner crab earnings for small vessels occurred in 1978 at $65,800. For large vessels, peak earnings were also realized in 1978 at $163,800. The overall average of $112,800 for the 148 vessels in the fishery that year was also the highest recorded during the study period.

Costs and Net Earnings

Gross earnings are subject to a variety of fixed and variable costs before they become net earnings. Unfortunately the only recent data on costs and net earnings in any Kodiak area fishery is for the Kodiak purse seine fishery; it is in a survey conducted by the Alaska Sea Grant Program and the United Fishermen of Alaska (Larson 1980). The survey provides cost and net earnings on the Kodiak salmon purse seine, salmon set gillnet, and herring gillnet fisheries for the 1979 fishing season.

For the salmon purse seine fishery, 49 respondents reported average gross salmon earnings of $60,639 of which $57,365 were season gross (paid during the season) and $6,418 was post season price adjustment (commonly termed bonus). Operating expenses (including labor costs - crewshares) averaged $25,590 while capital equipment expenses averaged $9,563. The net cash available to the operator/owner after expenses was $22,486 or 37 percent of the total gross. Non-Alaskan and Kodiak resident fishermen earned similar amounts after expenses; however, other Alaskan residents took home only 50 percent ($12,687) as much as the other two residency groups. No data is provided to determine whether or not the other Alaskan resident category includes Kodiak village fishermen or not.

The average crew size was 3.2 crewmen in addition to the captain with non-Alaskan fishermen having slightly larger crews than Alaskan fishermen. Although Larson does not provide a crewshare rate, an averge crewshare of 10 percent of gross earnings would produce a total average labor cost of $19,405 which when deducted from operating expenses of $25,590 would leave a remainder of $6,185 for fuel, food, and miscellaneous expenses. This is certainly a plausible scenario.

The Kodiak set gillnet fishery was lucrative in 1979 according to the survey. A total of 45 respondents reported average gross earnings of $18,353. Unlike the purse seine fishery, in the set gillnet fishery the Kodiak residents outearned non-Alaskan residents $17,777 to $15,937. Other Alaskan residents earned only $13,200. Operating expenses averaged $5,028 for all respondents while capital equipment purchases averaged $3,087. Net cash available from the enterprise for all respondents was $10,238 with similar amounts available to both Kodiak and non-Alaskan fishermen.

In 1979, set gillnet fishermen reported an average of 3.5 crewmen in addition to the operator (Larson 1980:15). As in the purse seine fishery, other Alaskan and non-Alaskan fishermen reported a larger crew size than did the Kodiak fishermen. Crewshares were apparently below 10 percent on average since this rate would produce more operating expenses than reported. Given that many set gillnet operations are run by family units, an estimation of labor costs is not possible from the available data.

The herring gillnet fishery was not profitable for most participants in the 1979 season. A total of 12 fishermen reported average gross earnings of $3,390. Operating expenses averaged $2,538 and capital equipment $3,886. The net cash available was -$3,033 so that the average herring gillnet fisherman lost money. The herring gillnet operation involved 1.8 crewmen in addition to the operator.

HARVESTING: CHIGNIK REGION

Chignik area fisheries are considerably less diverse and valuable than those in the Kodiak area. Chignik area fishermen are much less numerous and proportionately take a far smaller share of Chignik area fisheries than do Kodiak area fishermen.

Participation in Limited Fisheries

There is only one limited entry fishery in the Chignik area, the salmon purse seine fishery. This reflects the overwhelming historical priority given to this gear. In this section we examine the geographic distribution of owners of limited entry permits, changes in distribution, Alaskan Native permit ownership and permit values.

Geographic Distribution of Permit Owners

Table 41 presents data on the geographic distribution since 1975 of Chignik permanent permits. The same conceptual categories are used as in the section on Kodiak area permits above; however, communities within the Chignik management area are considered local for Chignik permits. Since there are no communities over 2,000 in the Chignik area, all local permits are rural.

Chignik enjoys the distinction of being the only fishery in Alaska in which the absolute and proportionate holding of permits by rural local residents increased from 1975 to 1983. The initial level of 27 and 31.8 percent increased to 38 and 42.2 percent by 1982. According to CFEC records, the increase in rural local permit holdings is due to the migration of individuals to the area rather than transfer of permits.

TABLE 41

CHIGNIK SALMON PERMIT OWNERSHIP BY RESIDENCY
1975-1983

Year	Rural Local	Rural Non-Local	Urban Local	Urban Non-Local	Non-Resident	Total
1975	17 (31.8%)	13 (15.3%)	0 (0%)	24 (78.2%)	21 (24.7%)	85
1976	31 (34.4%)	14 (15.6%)	0 (0%)	27 (30.0%)	18 (20.0%)	90
1977	31 (34.4%)	12 (13.3%)	0 (0%)	30 (33.0%)	17 (18.9%)	90
1978	34 (37.8%)	11 (12.2%)	0 (0%)	28 (31.1%)	17 (18.9%)	90
1979	34 (37.8%)	10 (11.1%)	0 (0%)	29 (32.2%)	17 (18.9%)	90
1980	35 (38.9%)	10 (11.1%)	0 (0%)	29 (32.2%)	16 (17.8%)	90
1981	34 (37.8%)	9 (10.0%)	0 (0%)	29 (32.2%)	18 (20.0%)	90
1982	38 (42.2%)	10 (11.1%)	0 (0%)	24 (26.7%)	18 (20.0%)	90
1983	40 (44.4%)	10 (11.1%)	0 (0%)	23 (25.6%)	17 (18.9%)	90

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*CFEC reports indicate that the 11 permit increase in the rural local category is due to migration of permit holders from other areas to the Chignik area.

Source: Dinneford and Kamali 1984: 28, Dinneford 1984:23

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The urban nonlocal cohort of permit ownership resides primarily in Kodiak city. Many of those individuals were originally from Chignik area communities and continue to maintain close contact with relatives. Movement of individuals back to the Chignik area accounts for the majority of the shifted permits. The rural nonlocal cohort is concentrated in Sand Point and Kodiak villages.

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Alaskan Native Ownership of Chignik Permits

Alaskan Native limited entry permit ownership is distinctive in the Chignik area for its initial level of ownership and for the maintenance of permits in Alaskan Native hands since they were first issued. Table 42 presents data on the distribution of Native permits at initial issuance. They owned 78 of 90 (86.7%) permanent Chignik purse seine permits. This compares with a statewide average of 52.6 percent of total limited entry permits issued to Alaskan Natives (Kamali 1984: 6). In all residence categories Alaskan Natives comprised a majority of those who received permits with the rural local cohort being the most numerous (29 permits representing 37.2 percent of total Native ownership). The second most numerous cohort was the urban nonlocal group which held 25 permits (32 percent of the total). Based on CFEC tabulations of Chignik area salmon earnings by Kodiak city residents, it appears this entire cohort resides in Kodiak city.

TABLE 42

DISTRIBUTION OF CHIGNIK AREA ALASKA NATIVE OWNED PERMITS
BY RESIDENCY AT INITIAL ISSUE

	ETHNICITY			
RESIDENCE	Native	% of Native	Other	Sum
Rural Local	29	(37.2%)	0	29
Rural Nonlocal	11	(14.1%)	1	12
Urban Local	0	(0%)	0	0
Urban Nonlocal	25	(32.0%)	3	28
Nonresident	13	(16.7%)	8	21
TOTAL NATIVE	78	(86.7%)	12	90

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SOURCE: Kamali 1984:7,12

More striking than the initial level of permit ownership is the tenacity with which Alaska Natives owners of Chignik area permits have held on to them. Table 43 provides a summary of the permanent transfers of Chignik permits by Alaskan Native owners. Only four permits were transferred between 1975 and 1983 resulting in a loss of only three permits, or a 3.8 percent decline from the initial ownership level. This is significantly better than the statewide rate of 13.8 percent decline in Native permit ownership, and is even more remarkable given that the Chignik salmon purse seine permit is probably the most valuable in the state.

Permit Value

The Commercial Fisheries Entry Commission survey of prices of permits when transferred is the source of values placed on limited entry permits.

TABLE 43
CHANGES IN ALASKAN NATIVE OWNERSHIP OF CHIGNIK AREA LIMITED ENTRY PERMITS, 1975-1983

	TRANSFERS OF ALASKA NATIVE OWNED PERMITS		
YEAR	Transfers By Natives	Transfers To Natives	Sum
1975	0	0	0
1976	0	0	0
1977	0	0	0
1978	0	0	0
1979	0	0	0
1980	0	0	0
1981	1	0	-1
1982	2	1	-1
1983	1	0	-1
Total	4	1	-3
% Loss of Initial Issue			(-3.8 %)

Source: Kamali 1984:36-37

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To provide confidentially protection, prices can only be quoted if there are at least four transactions during a time period. Since there have been so few sales of Chignik permits there are no formally quoted prices. The estimated value of a Chignik permit in 1979-80 was $175,000 to $250,000. More recently it has been estimated by knowledgeable fishermen in Kodiak to be worth $350,000 to $500,000.

Vessel Characteristics

The high earnings realized in the Chignik purse seine fishery since 1976 have led to dramatic transformation of the fleet. Table 44 summarizes changes in a number of characteristics of the vessels operating in the Chignik purse seine fishery over the period from 1969 to 1980. By 1980, 57 of the 101 vessels fishing were five years old or less and all had diesels engines, and with one exception, fiberglass hulls. Overall average length increased as well as the new vessels concentrated in the the 36-42 foot range. Gross and net tonnage, nearly doubled and the average horsepower increased by more than 50 percent during the period.

Participation in Unlimited Fisheries

In recent years, as fisheries activities in the western Gulf of Alaska have diversified and increased, resources of the Chignik region have received

TABLE 44

CHARACTERISTICS OF CHIGNIK AREA SALMON PURSE SEINE VESSELS, 1969-1980

YEAR	FLEET SIZE		REG. LENGTH	REG. BREADTH	REG. DEPTH	GROSS TONS	NET TONS	VESSEL AGE	HORSE POWER	DIESEL	WOOD HULLS	STEEL HULLS	GLASS HULLS	ALUM HULLS
1969	64	MEAN	32.1	12.14	4.00	10.68	8.28	10.76	134.16	.565	1	.000	.000	.000
		SDEV	1.5	0.85	0.50	1.44	1.55	6.43	34.85					
		COUNT	61	58	58	59	64	62	61	62	62	62	62	62
1970	69	MEAN	31.7	12.29	4.15	11.27	8.49	9.64	135.56	.609	.938	.000	.063	.000
		SDEV	2.5	0.85	0.76	2.34	2.54	6.27	36.32					
		COUNT	63	59	59	60	67	64	61	64	64	64	64	64
1971	76	MEAN	32.5	12.49	4.41	12.59	9.78	9.21	143.28	.685	.849	.000	.151	.000
		SDEV	3.0	0.95	1.00	4.28	3.67	6.88	41.33					
		COUNT	73	68	68	69	74	72	71	73	73	73	73	73
1972	79	MEAN	32.9	12.56	4.50	13.19	10.42	9.60	146.91	.711	.803	.000	.197	.000
		SDEV	3.0	0.95	1.02	4.75	4.15	7.25	42.49					
		COUNT	76	72	72	73	77	75	74	76	76	76	76	76
1973	78	MEAN	33.2	12.66	4.56	13.93	11.01	9.80	153.10	.720	.747	.000	.253	.000
		SDEV	3.3	1.00	1.03	5.60	4.86	7.37	46.81					
		COUNT	75	71	71	72	76	74	73	75	75	75	75	75
1974	92	MEAN	33.4	12.75	4.69	14.74	11.53	10.44	153.20	.758	.736	.011	.253	.000
		SDEV	3.7	1.10	1.07	6.48	5.37	7.44	47.74					
		COUNT	90	85	85	86	91	90	89	91	91	91	91	91
1975	85	MEAN	33.5	12.76	4.72	14.61	11.33	11.19	150.91	.783	.723	.012	.265	.000
		SDEV	3.2	1.08	1.06	6.34	5.29	6.94	46.43					
		COUNT	82	78	78	79	85	83	82	83	83	83	83	83
1976	77	MEAN	33.5	12.69	4.64	14.44	11.53	12.16	150.99	.763	.724	.000	.276	.000
		SDEV	2.9	0.99	1.01	6.00	5.29	7.05	49.32					
		COUNT	75	72	72	73	77	76	75	76	76	76	76	76
1977	86	MEAN	33.9	12.73	4.76	15.18	12.16	11.47	162.60	.791	.647	.000	.353	.000
		SDEV	3.0	1.03	1.03	6.15	5.28	7.75	56.07					
		COUNT	86	83	83	84	86	86	84	86	85	85	85	85
1978	95	MEAN	35.0	13.10	5.13	17.96	14.17	8.77	189.73	.979	.447	.000	.532	.021
		SDEV	3.2	1.01	1.05	6.80	5.84	8.06	77.30					
		COUNT	95	90	89	92	95	95	92	95	94	94	94	94
1979	113	MEAN	35.1	13.23	5.25	18.90	14.86	8.37	198.83	.955	.393	.000	.559	.018
		SDEV	4.1	0.95	1.02	6.70	5.85	8.35	83.86					
		COUNT	113	104	103	106	110	113	109	112	112	112	112	112
1980	101	MEAN	36.7	13.42	5.40	20.90	16.60	6.96	219.37	1	.270	.000	.710	.020
		SDEV	3.8	0.90	1.01	7.26	5.95	7.53	82.40					
		COUNT	100	85	84	94	97	101	92	101	100	100	100	100

Fleet size = number of units of gear.
Length, breadth and depth in feet.
Age in years.

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SOURCE: CFEC 1982:81

growing attention. However, most of the increased harvests have been taken not by residents of Chignik communities but rather by fishermen from Kodiak city and Sand Point. The one alternative to salmon which has attracted Chignik fishermen over the years is the halibut fishery. From 1975 to 1979, CFEC data indicate an average of 7.2 Chignik salmon purse seine fishermen participated in the Chignik area halibut fishery. That number appears to have increased somewhat in more recent years.

In the king crab fishery, effort levels have remained fairly stable during the period with 20-25 vessels normally participating. Through 1980, however, CFEC data indicate that no more than four vessels which purse seined for salmon in the Chignik area participated in the king crab fishery. Furthermore this only occurred in three years--in all other years, no Chignik salmon purse seiners participated in the king crab fishery. This means that a maximum of 25 percent of the vessels fishing for king crab in Chignik waters were those of Chignik residents. These figures may, however, underrepresent participation in the king crab fishery because it only represents participation in the Kodiak and Cook Inlet areas and not the Peninsula area in which the Chignik district falls.

Interest in tanner crab in the Chignik district has been much greater among Chignik area fishermen (as well as those from other areas) than interest in king crab. The number of tanner crab vessels has more than doubled from 21 in 1975 to 48 in 1983. It is likely that further increases occurred again in the 1984 and 1985 seasons. Chignik salmon purse seine fishermen have been more active in tanner crab, but the CFEC data only indicate participation in the Kodiak and Cook Inlet areas and not the Peninsula area. Beginning in 1978, however, Chignik purse seine fishermen did begin fishing in the tanner crab fisheries of these other two areas.

Participation in the dungeness fishery has also increased dramatically in recent years, growing from one vessel and seven landings in 1981 to 18 vessels and 132 landings in 1983-84. None, however, were Chignik residents.

Participation in Chignik shrimp fisheries peaked in 1975-1976 when 50 vessels made 334 landings. No fishery has occurred in the Chignik district since 1981. No Chignik resident vessels were involved in the shrimp fisheries.

The groundfish resources of the Chignik region have long attracted significant foreign effort. Particularly impressive are the efforts of Japanese and Korean factory trawlers fishing for pollock in the southwestern part of the district. In recent years this has occurred in the winter months (December-February) prior to pollock schooling and spawning in southern Shelikof Strait.

Value of Fisheries Harvests

The Chignik region has virtually the same complement of commercial fisheries as the Kodiak region; however the distribution of value among them is significantly different. Salmon are by far the most valuable species in the Chignik region as is evident from Table 45. Only in 1975 when

TABLE 45

TOTAL EX-VESSEL VALUE OF CHIGNIK REGION FISHERIES HARVESTED BY U.S. FISHERMEN BY SPECIES, 1975-1983

(Thousands of Dollars)

Species	YEAR								
	1975	1976	1977	1978	1979	1980	1981	1982	1983
Salmon	1770.2	5654.7	15966.3	17362.6	16053.0	8659.6	22090.0	16830.6	11705.8
(% of total)	(33.2%)	(52.2%)	(70.5%)	(71.5%)	(70.3%)	(52%)	(89%)	(72.3%)	(62.9%)
Herring Sac Roe	–	–	–	–	–	747.0	257.7	114.0	81.0
(% of total)	(0%)	(0%)	(0%)	(0%)	(0%)	(5%)	(1%)	(.5%)	(.4%)
Halibut	975.2	1176.9	989.1	912.1	152.2	61.4	49.0	1477.4	2165.8
(% of total)	(18.3%)	(10.9%)	(4.4%)	(3.7%)	(.7%)	(.4%)	(.2%)	(6.3%)	(11.6%)
Tanner Crab	510.9	1281.3	1872.1	1971.4	1394.8	1899.7	2338.4	3921.1	3917.1
(% of total)	(9.6%)	(11.8%)	(8.3%)	(8.1%)	(6.1%)	(11%)	(9%)	(16.8%)	(21.0%)
King Crab	54.0	124.6	200.7	175.4	154.9	185.5	17.2	179.1	–
(% of total)	(1.0%)	(1.1%)	(.9%)	(.7%)	(.7%)	(1%)	–	(.8%)	(0%)
Dungeness Crab	–	–	–	–	–	–	.7	182.6	645.2
(% of total)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	–	(.8%)	(3.5%)
Shrimp	2003.7	2570.7	3613.7	3791.2	4981.7	4996.0	27.6	–	–
(% of total)	(37.6%)	(23.7%)	(15.9%)	(15.6%)	(21.8%)	(30%)	(.1%)	(0%)	(0%)
Scallops	–	–	–	–	–	–	75.1	577.2	981.1
(% of total)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(.3%)	(2.5%)	(.5%)
Groundfish	17.4	21.8	15.3	85.1	95.9	–	29.1	–	*
(% of total)	(.3%)	(.2%)	(.1%)	(.3%)	(.4%)	(0%)	(.1%)	(0%)	(0%)
TOTAL	5331.4	10830.0	22657.2	24297.8	22832.6	16549.2	24884.8	23282.0	18613.0

* Trace

SOURCE: CFEC

salmon runs were at a low ebb, has the total contribution of salmon been less than 50 percent of total domestically landed commercial value; normally it contributes about two-thirds of region value. Salmon peaked in value in 1981 at $22.1 million, 88.8 percent of value. Catch values for 1984 were not available at the time of our analysis.

From 1975 to 1980, shrimp was typically the second most valuable species contributing between 15 and 35 percent annually. The collapse of shrimp stocks in 1981 reduced their contribution to regional value to zero percent after 1982.

The three crab species combined to provide between 6.8 and 24.5 percent of regional value. Tanner crab have made the greatest contribution ranging from a low of 6.1 percent in 1979 to a high of 21.0 percent in 1983. King crab have never exceeded 1.1 percent of the value. The recent expanded interest in dungeness crab pushed their share of regional value to 3.5 percent in 1983.

Halibut is next in importance in Chignik's regional commercial fisheries, but its contribution fluctuated wildly in the 1975-83 period ranging from a high of 18.3 percent in 1975, when halibut stocks were in adequate shape and salmon stocks in poor shape, to a low of .2 percent in 1981 when halibut stocks were at low levels and salmon at peak levels. Halibut stocks have recovered and are contributing about 10 percent to total Chignik region commercial fisheries value.

Sac roe herring have made a very minor contribution, peaking at 4.5 percent in 1980 when the fishery began. Scallops and groundfish (domestically landed) have both provided trace values to Chignik region fisheries. Additional value from Chignik area fisheries is also realized by domestic fishermen selling to foreign processors (joint ventures), foreign fishermen, and the U.S. government from fees applied to foreign catches.

Distribution of Value

The distribution of value from the salmon fishery, the most valuable one in the Chignik area, between Kodiak city and Chignik area resident fishermen is displayed in Table 46. Chignik residents have consistently had lower earnings than Kodiak city fishermen and both other Alaskan and nonAlaskan fishermen. Although the total amount of the fishery taken by Chignik fishermen increased over the study period, they still earned less than others. Kodiak city fishermen exceeded the average gross in four of the nine years of the study period. Together, Chignik and Kodiak city fishermen normally take between 60 and 65 percent of the value with the remaining 35-40 percent shared among the other Alaskan and non-Alaskan fishermen, who make up about 30 percent of the participants.

The number of Chignik resident fishermen who participated in the Chignik king and tanner crab fisheries over the study period are so few that distributional analyses are not particularly revealing.

TABLE 46

DISTRIBUTION OF CHIGNIK MANAGEMENT AREA SALMON EX-VESSEL EARNINGS, 1975-1983

(Thousands of Dollars)

Area Fishermen[1]

	CHIGNIK VILLAGES					KODIAK (CITY)					[2]		
Year	No.	% of Total	Average Gross	Total Value	% of Total	No.	% of Total	Average Gross	Total Value	% of Total	Total Fishers	Average Gross	Total Value
1975	32	37%	$19.9	$ 635.9	35.9%	25	29%	$21.4	$ 534.5	30.2%	86	$ 20.6	$1770.2
1976	32	42%	$62.2	$1991.8	35.2%	20	26%	$81.2	$1623.9	28.7%	77	$ 73.4	$5654.7
1977	35	40%	$159.0	$5564.3	34.8%	26	30%	$175.6	$4565.7	28.6%	88	$181.4	$15966.3
1978	37	39%	$168.8	$6243.9	36.0%	22	23%	$191.2	$4205.5	24.2%	95	$182.8	$17362.6
1979	48	48%	$110.5	$5305.4	33.0%	27	27%	$139.9	$3778.3	23.5%	101	$158.9	$16053.0
1980	53	53%	$55.3	$2931.9	33.9%	25	25%	$74.7	$1867.1	21.6%	101	$ 85.7	$8659.6
1981	48	47%	$185.1	$8886.7	40.2%	22	21%	$237.8	$5331.8	23.7%	103	$214.5	$22090.0
1982	61	58%	$109.9	$6702.1	39.8%	25	24%	$118.1	$2951.3	17.5%	105	$160.3	$16830.6
1983	55	55%	$98.3	$5407.4	46.2%	21	21%	$114.0	$2394.9	20.5%	100	$117.1	$11705.8
MEAN	44.6	47%	$108.8	$4852.1	37.6%	23.7	25%	$127.3	$3017.0	23.4%	95.1	$135.6	$12899.2

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[1] Total value computed by adding anonymous individual and confidential earnings together. Average gross computed by dividing the sum of anonymous individuals and confidential gross users into total value.

[2] Actual number who fished according to CFEC records.

SOURCE: CFEC

Costs and Net Earnings

No recent analysis of costs and net earnings in the Chignik purse seine fishery is available.

FISHERMEN'S ORGANIZATIONS

Kodiak fishermen are organized into a number of groups and have a history of substantial involvement in the political process at both state and federal levels. Among the political activities in which they have successfully participated are the conceptualization, drafting, and passage of the Fisheries Conservation and Management Act (FCMA) of 1977, opposition to OCS development in the Gulf of Alaska, and opposition to halibut limited entry. The halibut opposition was considered a significant factor in the blocking in 1983 by the Office of Management and Budget of the program proposed by the North Pacific Fishery Management Council. Kodiak fishermen were also responsible for an initiative in 1976 to repeal the state's limited entry program and, although the state's electorate voted to retain the program, the Kodiak census district expressed their opposition to limited entry by a considerable margin.

The two largest fishermen's organizations in the Kodiak region are the United Fishermen's Marketing Association (UFMA) and the Alaska Dragger's Association (ADA). These organizations represent the two basic strategies of fishing in the Kodiak area. The UFMA is primarily a fishermen's price negotiating body for salmon and crab fishermen to deal with processors. It has in the past called for its membership to refuse to produce if prices received from the processors are not satisfactory. In addition to its price negotiating functions, the UFMA is active in lobbying for regulations and legislation regarded as appropriate by its membership, backs local, state, and federal candidates who support its position, holds a seat on the board of directors of the statewide United Fishermen of Alaska, and participates in a variety of community service activities. In 1983 and 1984, the executive director of the UFMA served as a voting member on the North Pacific Fishery Management Council after previously serving on the Council's Advisory Panel. The executive director has also been a participant in the industry to industry talks between representatives of U.S. and Japanese commercial fishing industries.

The relative strength of the UFMA has waned somewhat in recent years in large part because of the collapse of the king crab fishery. Organizational revenues are derived from membership fees and assessments, and membership has declined since 1982. In 1985 there were about 100 members. As UFMA crabbers converted to dragging, the UFMA executive director attempted to become a conduit for establishing joint venture fishing opportunities for these clients. One important indicator of the difficulties facing UFMA are its political fortunes. The executive director's name was not submitted by the Governor in early 1985 for reappointment to the Council, apparently because of differences in objectives of state fisheries' policy. What precisely those policy differences were, other than perhaps halibut limited entry, are not clear.

The other major fishermen's organization in Kodiak is the Alaska Dragger's Association. This organization was metamorphosed from the Kodiak Shrimp Trawlers Association, a Kodiak-based organization representing the interests of the shrimpers from the 1960s through the mid-1970s. When it became apparent following passage of the FCMA that more opportunities for American fishermen to engage in trawling for groundfish in the Gulf of Alaska were going to be sought, leaders of the organization expanded its goals. With the decline of shrimp, which were harvested primarily by otter and beam trawls, many shrimpers looked expectantly to groundfishing as a way to continue. As the present executive director of the ADA said, "It was awful hard to take off that shrimp gear, but it had to be done." In 1985 the ADA had a membership of about 65 fishermen, all of whom engaged in at least some groundfishing during the year. This figure is down from over 80 in the shrimpers' association's peak years of the early-1970s but a sizable increase from less than 30 at the turn of the decade (1981). There are two reasons for the recent growth of the organization. Because of joint ventures, especially for pollock in Shelikof Strait, groundfishing is now an important element in the Kodiak area. This fishing has been taken up primarily by shrimpers switching from that fishery, although a number of crabbers have also converted. The second reason for ADA's growth is that it is now becoming statewide in its orientation. Groundfish draggers from all over Alaska are gravitating to the organization whose leadership has important political contacts.

The ADA has emerged as the voice of the majority of Alaskan resident groundfishermen in this role the group has actively participated in state and federal regulatory processes. The executive director is a member of the Kodiak Advisory Board to the Alaska Board of Fisheries and serves on the Advisory Panel of the North Pacific Fishery Management Council. In addition, the ADA's leadership is also a participant in the "industry to industry" talks between leaders of the American North Pacific fishing industry and their counterparts in Japan. This provides the ADA leadership with important contacts and information for coordinating joint venture opportunities for Alaskan fishermen. This combination of factors and initiatives has gained a powerful footing for the ADA in state and federal fisheries politics. A measure of this political clout is seen in the fact that whereas the name of the executive director of the UFMA was not submitted by the Governor for renomination to the North Pacific Council, the name of an important member of the ADA leadership and groundfishermen (ex-shrimper) was submitted. Observers of the scene regarded this as a direct replacement in order to obtain a voice on the Council more responsive to the Governor's policy objectives.

The halibut fishery, as has been demonstrated, has recently risen to greater importance in the Kodiak area. The Kodiak Halibut Fishermen's Association (KHFA), which had been a moribund organization throughout most of the 1970s, suddenly gained substantial new membership and importance. The organization was represented at the annual International Pacific Halibut Commission (IPHC) meetings where halibut seasons and regulations are established. In 1981, a steering committee composed of representatives of various Alaskan and Washington halibut fishermen's associations, voted to support limited entry in the halibut fishery. The president of KHFA signed the steering committee's report in support of the position. When he returned to Kodiak, the organization called a meeting and took a vote to repudiate the president's support of limited entry. New leadership took over following the incident. Increased membership in the organization clearly reflected the longstanding opposition of a significant sector of the Kodiak fleet to limited entry. Those opposed have persisted in their resistance and have consistently called on the IPHC to establish short seasons interspersed throughout the year to overcome the problems of market glut and large numbers of fishermen. In 1985, this seasonal strategy was followed.

In addition to KHFA, a more direct and vocal group of halibut fishermen appeared in 1982 to oppose a share quota system of halibut limited entry. The North Pacific Fishery Management Council began consideration of this particular form of limit in which fishermen are awarded percentage shares of the fishery based on previous performance (catch levels in 1981) (Langdon and Miller 1984). The organization is called Kodiak Fishermen Against Shares and is actively opposing this form of limited entry.

There are several other smaller fishermen's organizations in the Kodiak area. It should be noted that the UFMA negotiates prices for salmon purse seiners; set gillnetters have a separate price negotiating group.

Do the village fishermen participate in these fisheries organizations? There is little evidence that they do. Langdon and Miller (1984) found no Kodiak village fishermen belonging to any fishermen's organizations. Instead it appears that the Kodiak Area Native Association or local councils are used to express Koniag positions on fisheries issues. For example, KANA submitted a letter of opposition to halibut limited entry to the North Pacific Fishery Management Council.

PROCESSING

In the late 1970s and early 1980s, Kodiak rose to a position in the top three United States fishing ports in landed value. In 1981 it was the top port in the nation. In order for a community to have landings, it must have a fish processing sector. And Kodiak has the largest and most diversified processing sector of any port in Alaska. In this section we discuss the number and capabilities of processing facilities, recent expansion and failure, their present ownership, prices paid for salmon and crab, and wholesale values of salmon products. The employment characteristics of canneries are noted. A brief discussion is provided on the surimi production that began in January, 1985 in one Kodiak plant. Details on the economic aspects of this sector are in Chapters V and VII.

History

Prior to 1950, processing facilities in the Kodiak area were devoted almost solely to salmon. There were several herring reduction plants which closed in the late 1940s, and a cold storage at Port Williams on Shuyak Island which was the major location for halibut landings at that time. With the emergence of the king crab fishery in the 1950s, new plants were built and some salmon facilities were expanded to add new crab processing capabilities. An early peak in the crab processing industry was reached in 1966 when 32 processors processed 90 million pounds. Low harvest levels in both salmon and crab in the late 1960s and early 1970s reduced the number of operating plants to about 16 with 12 operating in the Kodiak area. Another factor in the decline of the Kodiak sector was the decision by several plants to relocate in Unalaska and Dutch Harbor to be closer to the major sources of supply. Prior to these moves Kodiak plants benefited from the processing of shellfish caught in Bering Sea and Aleutian Island areas.

A new phase of expansion in Kodiak began about 1975 with the resurgence of king crab stocks. This was buttressed by a rebounding of salmon harvests in 1976. These biological conditions set the stage for an expansion that continued through the late 1970s. By the late 1970s, Terry et al. (1980:297) noted that Kodiak had an excess of harvesting capacity. Although the physical capacity in Kodiak continues to be greater than presently needed to harvest the resource, much of that capacity is not utilized because of firm failures. But before discussing recent problems, the expansion of the Kodiak processing cabability needs to be documented.

Plant Growth. Expansion of Kodiak processing capabilities can be traced to 1972 according to one long-time Kodiak processing superintendent who gave the following account of that growth. In 1967 he identified the following plants as being the major processors in Kodiak: Whitney-Fidalgo, Columbia Wards Fisheries, Alaska Packers Association, North Pacific Processors, Panalaska, Ursin's, King Crab, Eastpoint, Alaska Pacific Seafoods, and Martin's, which he identified as a small fresh fish operation. Other than Martin's, all of the other plants were primarily engaged in some combination of salmon and crab processing.

In 1968, the Western Alaska (then known as B&B Fisheries) processing plant was built. In 1972, King Crab, Inc. doubled their floor space. In 1974 Alaska Pacific Seafood expanded their plant by 40 percent to accomodate greater crab production. In 1975, Eastpoint, previously housed in the King Crab facility, built a separate plant and shifted from shrimp into crab, salmon, and halibut. In 1976 Pacific Pearl built a huge new processing facility to handle salmon, crab, and halibut. In 1977, Swiftsure took over the old Martin's fresh fish operation and expanded the plant. In 1977-78 Whitney-Fidalgo doubled its floor capacity in order to add freezers for crab. In 1979, King Crab added three blast freezer tunnels for salmon and halibut. In 1979-80, the International Seafood processing plant, owned by the Universal Life Church of Reverend Moon, was built--marking the last major plant to be constructed. In 1980, Western Alaska added additional blast tunnels for salmon processing. All Alaska and Ursin's made recent investments in 1981 and 1984 respectively to upgrade their salmon processing capacity. The Swiftsure plant which had been sold to Koniag, Inc. was sold to local fishermen who converted it into a cod and groundfish processing plant. In 1984, Alaska Fresh substantially rebuilt its facility with an eye towards developing a specialty in fresh and frozen bottomfish.

Reasons for Growth. A major reason for investment and growth in the period from 1977 to 1980 was to provide space for expanded freezing operations. The freezers were to be used for both salmon and crab. In addition, expansion was also keyed to expansion of processing imported salmon from other Alaskan districts. Surplus fish from Bristol Bay, Chignik, and Prince William Sound were sought out by Kodiak processors trying to take advantage of their location. A study of the market structure of the Alaska seafood processing industry indicates that in 1980, Kodiak had approximately 25 percent more fish processed than were harvested in the Kodiak management area (Orth et al. 1981:256). Previous experience with importing shellfish from western Alaska apparently provided Kodiak processors with a precedent for surviving by obtaining product from other areas of the state. Because importation is in part constrained by transportation costs, it is easier to obtain resources from areas closer to Kodiak. In recent years, Kodiak processors have begun purchasing salmon from the Chignik fishery in order to increase their sources of supply and make up somewhat for declines in the crab fishery.

Failures. Since 1982 a number of plants have been forced to close because of the collapse of king crab stocks, poor management, a 1982 botulism crisis in the canned salmon industry, and because the strength of the American dollar was making U.S. products too expensive in foreign markets. There were also problems in the cost of production. Rapidly rising power and water costs in the early 1980s are cited as additional factors leading to processor failure. One source indicated that problems could already be perceived in 1979 when the rate of return of Kodiak plants began to decline because of the increased competition for the resource. This is a major reason why Kodiak area processors began reaching out at that time for products from other areas.

The failure in 1979 of the New England Fish Company, the largest U.S. fish processor, resulted first in the closure of the NEFCO plants in Kodiak and Uganik Bay. The facilities were subsequently sold to Ocean Beauty, a subsidiary of Sealaska (the regional corporation created by the Alaska Native Claims Settlement Act for Alaskan Natives in southeast Alaska) who in turn sold the Uganik Bay cannery to a group of Kodiak fishermen in 1983. The group operated the Uganik Bay facility as a salmon cannery in 1983 and 1984 with a loan from the Commercial Fisheries and Agricultural Bank. The lender recently foreclosed on the facility because of failure to make loan payments.

In 1981 a major effort was made to develop a specialized groundfish business on cod. For the investor, within a year, however, this enterprise had failed and gone into bankruptcy. From December 1983 to April 1984 nine plants in the Kodiak area purchased cod in a further attempt to diversify their efforts and survive. By November, however, only one plant (B&B Fisheries) continued to purchase and process cod. One plant (Swiftsure) went to a small scale cod and pollock filleting operation in 1983. This too met with failure attributed by its superintendent to marketing and cash flow difficulties. Another industry source said that the price needed by this firm to survive was undercut by a dumping of Canadian cod on west coast markets at a crucial juncture of the operation. Recent attempts by

Kodiak processors to purchase cod and penetrate U.S. west coast markets have not been successful. This has led to the demise of two shore-based operations.

As of early 1985, the following plants were not in production and no plans were apparent to return them to production: Pacific Pearl (purchased by International Seafoods), Kodiak International Seafoods Inc. (Larsen Bay), Uganik Bay, Swiftsure, and Pan-Alaska. One industry source reported that "All the plants are in deep shit" and identified three additional plants that could well close by the end of 1985.

Ownership. As the result of failures, a number of changes in ownership have taken place in the past five years. However, another trend, established in the 1970s, has continued. Beginning in 1965 and accelerating in 1972, ownership of Alaskan shore-based processing facilities by Japanese firms, either jointly or in consortiums with American firms, has become prominent. A study of foreign ownership in Alaskan processing conducted for the State legislature in 1979 (Orth and Associates 1980:189-192) found the following pattern of ownership in the Kodiak area at that time:

American Ownership	Japanese Ownership less than 25%	Japanese Ownership greater than 25%
Alaska Packers Assoc.	Columbia Wards (9%)	Alaska Pacific Seafoods (50%)
East Point Seafoods		Western Alaska (100%)
Nefco		Kodiak King Crab (50%)
Pacific Pearl		Universal Seafoods (25%)
Pan-Alaska Fisheries		Whitney-Fidalgo (99%)
Ursin Seafoods		

Although no other data were collected on foreign ownership for this report, the only major addition would be the International Seafoods enterprise. Interestingly, three of the six American owned firms listed above have gone bankrupt since the 1980 report. On the other hand, none of the Japanese firms with ownership greater than 25 percent have gone under. In addition, it is Western Alaska that has continued to purchase cod and maintain a market for this product for their fishermen. Finally, it is Alaska Pacific Seafoods that has undertaken the attempt to process surimi, apparently successfully albeit with a significant subsidy from an Alaska Fisheries Development Foundation grant and Sea Grant assistance.

Location. In the recent past, processing facilities were distributed at a number of locations around the Kodiak archipelago including Port Bailey, Larsen Bay, Uganik Bay, Uyak Bay, Port Williams, Lazy Bay, and Port Lions. Through the combination of firm failures, cooperative agreements between processors, better tendering abilities and plant destruction from fires, processing of both salmon and crab has come to be more and more concentrated in Kodiak city. In 1985 it was expected that the only plant outside of the city of Kodiak to operate in the Kodiak management area would be the Columbia Wards salmon cannery at Lazy Bay on the southwest end of Kodiak Island.

Processing Outlooks

There is, however, some optimism. In the view of one long time processor, there is plenty of opportunity in terms of markets, products, and resources. He further indicated that costs of purchasing products from fishermen to keep them financially afloat are not prohibitive nor are labor costs in the plants, and a decent rate of return can be realized. In this view, the major problem is an unwillingness of management to do the necessary hard work in market development to take advantage of new opportunities. They are unwilling, in this view, because they are accustomed to a high rate of return from crab (especially) which is simply not available in the newer more competitive opportunities.

New efforts to enter the groundfish industry appear to be occurring along the lines of small catcher-processor vessels in the 80-100 foot range owned and operated by an individual fishermen or small group of fishermen. Small scale entrepreneurial endeavors may be the only way to survive at the present time in this new industry. Efforts by the larger corporate enterprises may go in different directions, such as surimi production, in order to survive in the new environment.

Other observers are considerably more pessimistic. In their view, the turn from crab to groundfish is dangerous and counterproductive. They note that groundfish value cannot replace but a fraction (perhaps 33 percent) of king and tanner crab value and that to see it as an industry savior is a flawed illusion. Most importantly, they claim that dragging of the ocean bottom by trawls will not allow king crab stocks to recover. This view, also shared by many commercial fisheries biologists, led to a proposal in 1984 to close many inshore waters to dragging in order to protect crab stocks. This proposal was not accepted by the North Pacific Fishery Management Council after strong lobbying pressure by the groundfishermen. A "gentlemen's agreement" to stay out of certain key areas was accepted by the Alaska Dragger's Association; however, commercial fisheries biologists indicate it was violated by draggers who were not members of ADA. These views of the current situation and the way out of it are producing fundamental and major cleavages in the Kodiak fishing community which has heretofore been characterized by its ability to pull together in crisis situations rather than to be pulled apart by them. In 1986, federal closures around Kodiak Island for on-bottom trawling were implemented.

Employment

With the decline in crab and the closing of plants, the year-round nature of processing and employment in the processing sector has changed dramatically. Fish and Game figures indicate that through 1982, employment during the peak of the salmon season in Kodiak area plants rose from 1517 employees in 1976 to 2928 in 1982. Increases in the major Kodiak plants appear in the 1977 to 1979 period with only slight increases since that time. Although peak period employment for salmon has remained fairly stable since 1979, positions, and more importantly time has dropped sharply during the winter crab seasons. Hours began going down for crab employees as early as 1982 according to industry sources and cannery workers. The decline in the number of days worked resulted from more plants and less product. The lack of sustained year-round employment has meant the departure from Kodiak of a significant segment of the Filipino population who had been employed in the industry. (See Chapters V, VII, and VIII.)

At the present time, a core of 15-25 employees are maintained by plants on a year-round contract basis, depending on plant size. To this core are added "whistle-stop" labor on a daily basis through radio announcements. Cannery superintendents indicated that one of the ways they are coping with the present economic slump is through cutting back office staffs to the bare minimum. One superintendent indicated that he was the only employee on the payroll during periods when the plant was not operating and that he did half of the firm's bookkeeping as well. In order to continue working and attempt to develop a market for cod, processing employees in one plant have taken reductions in the the hourly wage they normally earn during salmon and crab processing. Workers on the surimi line, however, were receiving the same rate of pay earned during crab seasons.

Unions. Only a small percentage of Kodiak's processing line employees were members of unions in 1985. Efforts to organize more workers failed as recently as two years prior to 1985. Only one firm operated a completely union shop.

Earnings. With the exception of contract employees, processing workers in the Kodiak area have taken sharp reductions in earnings since 1981. Indeed many have either left Kodiak completely or sought employment in other sectors of the economy. Hourly, seasonal, and average wages are not included in this analysis. (See Chapter V).

Labor Sources. In the past, processors have had to import significant numbers of workers during the salmon season, particularly for plants not located in Kodiak city. During the 1970s, the year round nature of the processing industry attracted a resident workforce, particularly of Filipino descent. This population plus the college age population attracted to Kodiak by the lure of wages on fishing vessels in the late 1970s, apparently have made it no longer necessary for processors to arrange for the importation of labor. The remnants of the immigrant processing workforce plus returning and visiting summer college students have been sufficient to supply Kodiak processors with enough labor for the peak salmon period.

GROUNDFISH

In enacting the Fisheries Conservation and Management Act of 1977 (FCMA), one of Congress' explicit objectives was to create opportunity for the domestic commercial fishing industry to take over and develop groundfishing. Nowhere was the promise of this new enterprise seen to be greater than in waters of the Gulf of Alaska and the Bering Sea. And nowhere has the realization of that promise been more frustrating than to the fishermen and processors of Kodiak. The primary reason for this frustration has been the failure to develop a domestic groundfishing industry composed of U.S. fishermen delivering groundfish to shore-based processors.

The developing Kodiak groundfish industry is discussed in the following segment. The structure of the commercial efforts, the distribution of the catch between the different segments, the Kodiak resident fishermen's participation in the fishery, and the recently developed surimi processing initiative at Alaska Pacific Seafoods in Kodiak are reviewed.

The Structure of Groundfishing

Although there are several reasons why groundfish development has not occurred, a major factor has been the existence of joint venture arrangements whereby American fishermen deliver groundfish catches in "codends" to foreign processors. The "codend" is the detachable portion of a trawl in which the fish are caught. This is not what was anticipated under the FCMA, but the structure of the FCMA has made it possible.

One of the primary constraints to U.S. groundfish development contained in the FCMA was its declaration that any fishery resources determined to be greater than needed for U.S. fishermen or processors were to be declared surplus and allocated among foreign nations who requested them. Foreign fishermen, primarily Japanese, had developed the gear, methods and information necessary to exploit the groundfisheries of the Gulf of Alaska and the Bering Sea. Similar capabilities were not found in the U.S. industry where fishermen were accustomed to pursuing high value resources and processors were strapped for investment capital. The foreign industry was thus delighted with the opportunity to continue their fisheries in the manner to which they had become accustomed. With the guarantee of continued access if no U.S. fishermen could catch or processor process resources, foreign fishermen and processors could continue their historical use patterns since it was not possible for the Department of Commerce to deny them access to the resources. However, there was an added twist. Suppose, for example, that some U.S. fishermen could catch the fish--then whatever foreign country was in a position to obtain those fish would be at an advantage over others who would have to wait for a declaration of surplus in order to gain access to them with foreign fishermen. This presented a different possibility that first became apparent in 1977.

In that year, the first proposal was made for U.S. fishermen to deliver to Korean motherships--factory vessels equipped to process groundfish at sea. Although first turned down by the North Pacific Fishery Management Council after extreme pressure came from the U.S. industry, the proposal was accepted the next year over those same objections. In 1979 a highly successful joint venture was conducted involving U.S. fishermen, primarily from Oregon, and Soviet motherships harvesting yellowfin sole and cod in the Bering Sea. With the establishment of this successful precedent, new pressures came to bear on the Japanese whose position as major beneficiary of the fishery resources of the Gulf of Alaska and the Bering Sea might be threatened. An additional and important element that emerged in 1980 was an amendment to the FCMA which allowed the federal government to withhold foreign allocations if the foreigners failed to conduct their fisheries in the manner specified by the U.S. government.

Out of this new environment developed the process of "industry-to-industry" talks. Certain leaders in the U.S. fish processing industry broke ranks with those opposing and attempting to halt joint ventures; they sought direct talks with leaders of the Japanese fishing industry in order to negotiate more favorable relationships than might occur if both sides took adamant positions. The situation they sought to avoid was one of the Japanese refusing to purchase U.S.-caught fish or to import U.S. fish products and of the U.S. refusing to allow Japanese fishermen to take their accustomed harvests. The goal was the continuation of some kind of relationship in which both sides could benefit rather than creating a complete impasse. Sectors of the U.S. industry wanted to make some gains rather than continue a potentially unproductive stance. In the industry to industry talks, Japanese leaders agreed to a schedule of increasing joint venture purchases over the following three years. Those concessions, however, were linked to a requirement for the maintenance of directed Japanese pollock harvest levels.

Joint ventures grew rapidly after 1980 as Japanese and Korean enterprises came to realize that this was a way to optimize access to resources. The Japanese attempted to use their position as major purchaser/consumer of pollock, the largest resource, to obtain guarantees that purchases of pollock from U.S. fishermen would not result in reductions of their directed harvests. Although they were able to gain such a concession in 1982, they were not able to sustain those concessions in later years.

The recent history of the harvest of pollock, by far the largest groundfish resource at the present time, is presented in Table 47. Shown are data for foreign fishermen, joint venture fishermen, and domestic fishermen (U.S. operators catching and delivering to U.S. processors). Note that foreign fishermen took the entire annual catch of pollock from the Gulf of Alaska in 1977 and 1978. In 1979, prior to the establishment of any joint ventures on Gulf of Alaska pollock, the domestic industry took its largest harvest of 4.5 million metric tons. In 1979 the first joint ventures occurred and they have increased every year since. In 1983, the joint venture fisheries took the majority of the pollock catch for the first time and again increased its proportion of the catch in 1984. It should also be noted that while joint venture catches were increasing, and foreign catches declining, domestic catches were declining too.

The distribution of the 1983 Gulf of Alaska pollock catch among different foreign and U.S. participants by area (see Fig. 4) is presented in Table 48. As this table indicates, joint venture fisheries were most numerous in

TABLE 47

ANNUAL POLLOCK CATCH IN THE GULF OF ALASKA BY FISHERIES CATEGORY, 1977-1984

(1,000 Metric Tons)

Year	Fisheries Category			
	Foreign	Joint-venture	Domestic	Total
1977	120.4	--	N.A.	120.4
1978	96.3	--	N.A.	96.3
1979	103.2	--	4.5	107.7
1980	113.0	1.1	2.2	116.3
1981	130.3	16.9	1.8	149.0
1982	92.6	73.9	2.2	168.8
1983	81.4	134.1	0.1	215.6
1984	N.A.	172.6[1]	N.A.	N.A.

[1] Preliminary estimate for Shelikof Strait fisheries in Jan-Apr.

N.A. - Not available.

Source: Alton 1984:18

TABLE 48

CATCH OF GULF OF ALASKA POLLOCK IN 1983 BY NATION OR FISHERIES CATEGORY AND NPFMC MANAGEMENT AREAS

(Metric Tons)

Nation or fisheries category	AREA			
	Western	Central	Eastern	All areas
Japan	17,492	30,191	41	47,724
ROK	21,827	11,806	--	33,633
Joint-venture	497	133,634	--	134,131
Domestic	5	118	--	123
Total	39,821	175,749	41	215,611

Source: Alton 1984:19

the Central area encompassing the Kodiak and Chignik regions while strictly foreign fisheries were conducted primarily in the Western region.

Kodiak Participation

At the time of this research there were 12-15 Kodiak resident fishermen participating either in joint venture, domestic or some combination of groundfishing enterprises. It was anticipated that between five and ten additional Kodiak vessels would enter groundfishing during 1985 primarily through converting crabbing vessels. Such conversions are estimated to cost between $400,000 and $600,000 and have therefore been less attractive to most Kodiak fishermen than converting to longlining for halibut and sablefish. As one ex-crabber now becoming a longliner said, "This bottomfish thing stinks of big money all the way." Far more is conveyed in this quotation about the attitude of many Kodiak fishermen to groundfishing than merely its riskiness.

Furthermore, the opportunities to enter joint ventures are becoming scarce. One source indicated that joint venture fishing is now saturated and that few additional opportunities are going to appear. Of the 95 vessels involved in joint ventures off Alaska in early 1985, 22 were Alaskan owned. With opportunities nonexistent and Alaskan participation at low levels, it is quite probable that a new wave of hostility toward joint ventures will appear. One attempt to provide new opportunities for Kodiak groundfish draggers is through shore-based production of surimi, the major product which Japanese trawlers and factory ships make from the pollock they catch. But before turning to a discussion of surimi production, another emergent variable in the groundfish equation requires attention.

Domestic Catcher-Processors

A major component of Japanese and Soviet high seas fisheries has been catcher-processors. These vessels ranging from 150 to 300 feet are capable of doing what their name implies--both harvesting and processing their catch into a final product. Some analysts have contended that a U.S. shore-based industry will never develop because catcher-processors of the factory variety are more efficient and new capital will flow to these enterprises rather than to shore-based plants. In fact there are now 22 domestic catcher-processors operating in Alaskan waters (primarily in the Bering Sea and Aleutian Islands) none of which are owned or operated by Kodiak fishermen, processors or residents. At the present time these vessels are interested primarily in cod for filleting and freezing and are not equipped to convert pollock into surimi. If they do become capable, then they indeed may take over the Gulf of Alaska groundfishery.

Surimi

This pollock-based product is made by a process developed by the Japanese that breaks pollock tissue down and combines it with water, sugar, salt, and other additives. The resulting pasty outcome has a wide variety of uses in the food industry, primarily as a substitute for other food products. One example is ersatz king crab legs made with surimi; this product is available in most Alaskan grocery stores. Since 1977, Japanese surimi trawlers have been taking the largest portion of the Gulf of Alaska pollock. As recently as 1984, the U.S. was an importer of surimi from Japan; however, there are now a set of institutional changes that may radically alter the world picture of surimi production.

In industry-to-industry talks conducted during December of 1984, the Japanese industry and government agreed to purchase 1750 tons of U.S. produced surimi. According to several Kodiak sources, the Japanese agreed to this provision because they did not expect U.S. processors to produce this quantity. By the middle of March, however, that amount had been surpassed at the Alaska Pacific Seafoods operation, but it was not clear if the Japanese had in fact purchased the production. One of the questions about U.S. surimi was whether it would be able to attain quality standards which the Japanese expect of their products. Kodiak sources claim that the high quality of local water and the rapid delivery of the fish have combined to produce a higher quality product than can be produced on the surimi trawlers. They are very optimistic that, if given an opportunity, the U.S. product can penetrate Japanese markets.

But if Alaskan surimi does not penetrate Japanese markets successfully, Alaska Pacific has an ace in the hole. The U.S. government has a quota on the importation of sugar-added products. Alaskan Senator Frank Murkowski had surimi designated as a sugar-added product in 1984 thus placing a quota on the quantity of Japanese surimi which U.S. food processors can import. That quota was filled in March of 1985 and should have resulted in a domestic market for Alaskan surimi. In 1984, the U.S. imported nearly 30,000 tons of surimi and use was expected to grow rapidly with projections for U.S. consumption of 500,000 tons in 1990. Although this all sounds very positive for the processing sector, it must be noted that such an increase in U.S. production of surimi does not mean that much to the harvesting sector in the Kodiak area since U.S. vessels are already harvesting the vast majority of the Gulf of Alaska pollock used for surimi production. For U.S. fishermen it simply means selling to a domestic (or partial domestic) rather than a foreign processor. There still remains, however, the Bering Sea pollock resource which has not yet been fully captured in joint venture activities but probably will be soon.

The Communities

Commercial fisheries play a crucial role in virtually all of the communities in the Kodiak and Chignik regions. In examining the place of the commercial fisheries in each of the communities, this section explores the number of fishermen, the number of limited entry permits, average gross earnings of individually reported fishermen, confidential community level earnings, fishing strategies and species mix, vessel characteristics, areas fished, relationship with processors, loans and financing, and patterns of crew characteristics. Communities of the Kodiak region are treated separately from those of the Chignik region.

KODIAK ISLAND AREA

The Kodiak area communities discussed in this section include Kodiak city (which includes populations connected by road to the city), Akhiok, Karluk, Old Harbor, Ouzinkie, Port Lions, and Larsen Bay.

Characteristics of fishermen from different Kodiak area communities on several variables are presented in Tables 49-52. A fisherman is defined as the gear license holder who is required by law to sign fish tickets. In most cases this is a vessel operator or captain. Crewmen are not included. The number of persons (reported and confidential) with commercial fishing earnings is presented in Table 49. Table 50 indicates the average earnings of reported individuals by community from CFEC records during the period 1975 to 1983. Fisheries pursued by confidential Kodiak area fishermen are reported for each community in Table 51. The CFEC's policy on confidentiality is that earnings will not be reported for individual fishermen if there are fewer than four cases in that combination of fisheries. If there is more than one case, they report the aggregate earnings of the group. Table 52 reports total, both individually reported and confidentially reported, gross earnings by species. The combination of reported and confidential gross earnings should give a close approximation of the commercial fisheries earnings realized by members of a given community; however, there are additional earnings which CFEC could not reveal because of the confidentiality policy.

Kodiak City

Kodiak city is far and away the dominant focus of fishing activity in the Kodiak region. It is home to a complex and diverse fishing fleet that has expanded dramatically in the past 35 years and that is presently diversifying at a rapid rate. It is also the home to virtually the entire processing capability of the archipelago since these facilities have become increasingly concentrated in the regional center over the past decade.

Table 49 indicates the number of fishermen who made commercial landings, both those with individual earnings reported anonymously by the CFEC and those whose earnings were not reported due to confidentiality considerations, residing in Kodiak city from 1975 to 1983. The total number of fishermen grew from 396 in 1975 to 812 in 1981 and then declined to 626 in 1983. Throughout the period Kodiak city fishermen comprised between 85 and 90 percent of the area's total resident fishermen. Confidential fishermen comprise a small proportion of Kodiak city fishermen compared to other communities. There is no clear trend in diversification apparent in the confidential data; however, there were more confidential fishermen in the period from 1977 to 1981 than there were either before or after.

The average total gross earnings of individually reported Kodiak city fishermen are presented in Table 50. The average earnings peak was obtained in 1978 at $129,900 while the low was realized in 1975 at $47,400. Gross average earnings between 1977 and 1981 exceeded $100,000 every year. After declining to $97,600 in 1982, gross earnings dropped even more sharply to $69,600 in 1983 (not including halibut earnings), the second lowest gross figure of the study period.

TABLE 49

KODIAK AREA FISHERMEN BY COMMUNITY, 1975-1983

Community					Year				
	1975	1976	1977	1978	1979	1980	1981	1982	1983
Kodiak City (1)									
Identified	393	459	553	596	701	720	802	774	622
Cofidential	3	7	14	9	13	10	11	9	4
Subtotal	396	466	567	605	714	730	812	783	626
Akhiok									
Identified	0	0	0	0	0	0	0	0	0
Confidential	3	3	1	3	2	3	1	0	0
Subtotal	3	3	1	3	2	3	1	0	0
Karluk									
Identified	5	11	5	0	0	0	0	0	0
Confidential	1	2	2	0	4	2	2	2	2
Subtotal	6	13	7	0	4	2	2	2	2
Larsen Bay									
Identified	13	13	18	19	10	19	19	12	10
Confidential	5	4	6	2	3	3	11	6	6
Subtotal	18	17	24	21	13	22	30	18	16
Old Harbor									
Identified	29	32	32	35	33	35	35	37	39
Confidential	2	2	2	2	0	6	2	0	2
Subtotal	31	34	34	37	33	41	37	37	41
Ouzinkie									
Identified	13	15	15	17	18	25	26	26	20
Confidential	5	2	2	3	2	4	2	0	3
Subtotal	18	17	17	20	20	29	28	26	23
Port Lions									
Identified	16	18	27	27	22	29	24	29	18
Confidential	1	1	1	2	4	3	4	1	2
Subtotal	17	19	28	29	26	32	28	30	20
TOTALS									
Identified	469	548	650	694	784	818	906	878	709
Confidential	20	20	28	21	28	31	33	18	19
All	489	568	678	715	812	849	938	896	728

(1) Confidential figures may indicate more fishermen than actually existed as data have been reported by species, gear, and vessel size, not by individual.

TABLE 50

KODIAK AREA TOTAL AVERAGE GROSS EARNINGS FOR FISHERMEN BY COMMUNITY, 1975-1983[1]

(Thousands of Dollars)

COMMUNITY	YEAR								
	1975	1976	1977	1978	1979	1980	1981	1982	1983[2]
Kodiak City									
No. Fishermen	393	459	553	596	701	720	802	774	622
% of total	(86%)	(85.8%)	(87.5%)	(88.3%)	(90.6%)	(89%)	(90.4%)	(89.9%)	(89%)
Average Gross	$ 47.4	$ 83.9	$ 112.2	$ 129.9	$ 107.7	$ 111.0	$ 104.8	$ 97.6	$ 69.6
Total	$18640.0	$38522.0	$62065.6	$77400.0	$75485.6	$79915.3	$84036.6	$75528.7	$43285.8
% of total	(94.3%)	(92.7%)	(97%)	(95.9%)	(96.5%)	(95.9%)	(94.9%)	(97.3%)	(95.9%)
Akhiok									
No. Fishermen	-	-	-	-	-	-	-	-	-
Average Gross	-	-	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	-	-	-
Karluk									
No. Fishermen	5	11	5	-	-	-	-	-	-
% of total	(1.1%)	(2.0%)	(.8%)						
Average Gross	$ 11.5	$ 18.4	$ 22.4	-	-	-	-	-	-
Total	$ 57.3	$ 202.7	$ 112.1	-	-	-	-	-	-
% of total	(.3%)	(.5%)	(.2%)						
Larsen Bay									
No. Fishermen	13	13	18	19	19	9	19	12	10
% of total	(2.8%)	(2.4%)	(2.8%)	(2.7%)	(1.3%)	(1.1)	(2.1%)	(1.4%)	(1.4%)
Average Gross	$ 10.4	$ 14.5	$ 12.7	$ 12.5	$ 10.3	$ 23.8	$ 24.6	$ 3.2	$ 6.8
Total Earnings	$ 134.6	$ 188.5	$ 227.9	$ 237.4	$ 195.4	$ 214.6	$ 466.8	$ 37.9	$ 68.3
% of total	(.7%)	(.4%)	(.4%)	(.3%)	(.2%)	(.3%)	(.5%)	(.05%)	(.15%)
Old Harbor									
No. Fishermen	29	32	32	35	33	35	35	37	39
% of total	(6.4%)	(6%)	(5%)	(5.2%)	(4.3%)	(4.3%)	(3.9%)	(4.3%)	(5.6%)
Average Gross	$ 11.2	$ 49.8	$ 42.6	$ 56.5	$ 42.7	$ 47.0	$ 83.4	$ 23.1	$ 31.5
Total	$ 325.2	$ 1592.3	$ 1363.7	$ 1976.6	$ 1410.0	$ 645.2	$ 2917.4	$ 853.3	$ 1228.7
% of total	(1.6%)	(3.8%)	(2.1%)	(2.4%)	(1.8%)	(2.0%)	(3.3%)	(1.1%)	(2.7%)
Ouzinkie									
No. Fishermen	13	15	15	17	18	25	26	26	20
% of total	(2.8%)	(2.8%)	(2.4%)	(2.5%)	(2.3%)	(3.1%)	(2.9%)	(3%)	(2.9%)
Average Gross	$ 12.3	$ 40.9	$ 35.6	$ 40.3	$ 29.9	$ 35.4	$ 30.4	$ 13.8	$ 16.5
Total	$ 160.4	$ 613.4	$ 533.5	$ 684.4	$ 537.7	$ 885.0	$ 790.9	$ 359.2	$ 329.4
% of total	(.8%)	(1.5%)	(.8%)	(.8%)	(.7%)	(1.1%)	(.9%)	(.5%)	(.7%)
Port Lions									
No. Fishermen	16	18	27	27	22	29	24	29	18
% of total	(3.5%)	(3.4%)	(4.3%)	(4%)	(2.8%)	(3.6%)	(2.7%)	(3.3%)	(2.6%)
Average Gross	$ 37.0	$ 35.3	$ 32.7	$ 23.1	$ 35.6	$ 31.9	$ 34.2	$ 30.4	$ 17.6
Total	$ 592.7	$ 635.5	$ 881.9	$ 623.5	$ 782.3	$ 924.9	$ 820.4	$ 881.9	$ 317.1
% of total	(.3%)	(1.5%)	(1.4%)	(.8%)	(1%)	(1.1%)	(.9%)	(1.1%)	(.7%)
Total									
No. Fishermen	469	548	650	694	793	818	906	878	709
Average Gross	$ 42.4	$ 76.2	$ 98.7	$ 116.6	$ 99.9	$ 102.2	$ 98.3	$ 88.4	$ 63.8
Grand Total	$19910.2	$41754.4	$64184.7	$80921.9	$78411.0	$83585.4	$89032.1	$77661.0	$45229.3

Cultural Dynamics

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[1] Individally reported cases.
[2] No halibut earnings.

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TABLE 51

CONFIDENTIAL KODIAK REGION FISHERMEN BY COMMUNITY, SPECIES, GEAR TYPE AND VESSEL SIZE, 1975 - 1983

COMMUNITY/ GEAR TYPE	YEAR 1975	1976	1977	1978	1979	1980	1981	1982	1983
Akhiok									
Purse Seine	1	1	0	0	1	1	1	0	0
Beach Seine	1	0	0	0	0	0	0	0	0
Set Gillnet	1	2	1	3	1	2	0	0	0
Total	3	3	1	3	2	3	1	0	0
Karluk									
Purse Seine	1	2	0	0	2	2	0	0	0
Beach Seine	0	3	2	2	2	0	2	2	2
Set Gillnet	0	0	0	0	0	0	0	0	0
Total salmon	1	2	2	0	4	2	2	2	2
Herring (food/ bait) (01)	0	1	0	0	0	0	0	0	0
Halibut	0	0	0	2	1	0	0	0	0
Larsen Bay									
Purse Seine	1	2	0	1	0	1	2	1	0
Beach Seine	0	1	2	0	0	0	0	0	0
Set Gillnet	3	0	2	0	0	0	1	2	0
Drift Gillnet(1)	1	1	0	0	0	0	0	0	0
Total	5	4	4	2	0	1	3	3	0
Halibut	0	0	2	1	0	0	3	0	0
King Crab ≥ 50' boat	0	0	0	0	1	1	2	2	0
Tanner Crab									
≥ 50' boat	0	0	0	0	1	1	1	1	3
≤ 50' boat	0	0	0	0	0	0	1	0	0
Dungeness Crab ≥ 50' boat	0	0	0	0	0	0	2	0	3
Herring (sac roe) Gillnet	0	0	0	0	1	0	0	0	0

Continued next page

TABLE 51 (Continued)

COMMUNITY/ GEAR TYPE	YEAR								
	1975	1976	1977	1978	1979	1980	1981	1982	1983
Old Harbor									
Purse Seine	0	0	0	2	0	5	2	0	1
Beach Seine	0	0	0	0	0	0	0	0	0
Set Gillnet	2	2	2	0	0	1	0	0	1
Total salmon	2	2	2	2	0	6	2	0	2
Halibut	0	0	2	2	2	2	3	2	0
King crab									
≥ 50' boat	0	2	3	3	2	3	3	3	0
≤ 50' boat	0	1	1	0	0	0	0	0	0
Tanner crab									
≥ 50' boat	0	0	0	3	0	0	1	0	3
≤ 50' boat	0	0	0	0	0	1	0	0	0
Herring (sac roe)									
Purse Seine	0	0	0	0	2	2	2	0	0
Gillnet	0	0	0	0	0	1	1	0	0
Ouzinkie									
Purse Seine	2[a]	0	1	2	2	3	1	0	1
Beach Seine	0	0	0	0	0	0	0	0	0
Set Gillnet	2	1	1	1	0	1	1	0	2
Total salmon	5	1	2	3	2	4	2	0	3
Halibut	0	2	0	0	0	0	0	1	0
King crab									
≥ 50' boat	3	0	3	0	2	0	0	3	0
≤ 50' boat	0	0	0	0	0	0	0	0	0
Tanner crab									
≥ 50' boat	2	3	3	2	0	0	0	0	2
≤ 50' boat	0	0	0	0	0	0	0	0	0
Shrimp									
Trawl	1	0	0	0	0	0	0	0	0
Pots	1	2	2	0	0	0	0	0	0
Misc. Finfish	0	0	1	1	0	0	0	0	0

[a] Permit fished in management area other than Kodiak

Continued next page

TABLE 51 (Continued)

COMMUNITY/					YEAR				
GEAR TYPE	1975	1976	1977	1978	1979	1980	1981	1982	1983
Herring (sac roe)									
Purse Seine	0	0	0	1	1	2	2	1	2
Gillnet	0	0	0	0	1	2	2	2	2
Port Lions									
Purse Seine	0	0	0	1	3	2	2	1	2
Beach Seine	0	0	0	0	0	1	1	0	0
Set Gillnet	1	1	1	1	1	0	1	0	0
Total salmon	1	1	1	2	4	3	4	1	2
Halibut	0	0	0	0	1	0	0	0	0
King crab									
≤ 50' boat	0	0	0	0	0	1	0	0	0
≥ 50' boat	0	3[a]	1[b]	0	0	1	0	0	1[b]
Tanner crab									
≤ 50' boat	0	0	0	0	1	0	0	1	1
≥ 50' boat	2	3	1	1	1	1	0	0	2
Dungeness crab									
≤ 50' boat	0	0	0	1	1	1	2	3	0
≥ 50' boat	0	0	0	0	0	0	0	0	1
Shrimp									
Trawl	0	0	0	0	0	0	0	1	0
Pots	0	0	0	1	0	0	0	0	0
Herring (sac roe)									
Purse Seine	0	0	0	0	0	1	1	0	0
Gillnet	0	0	0	0	0	1	0	0	0
Other	0	0	1	0	0	0	0	0	0
Herring (food/bait)									
Gillnet	0	0	0	0	0	0	1	1	0

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[a] Two went to the Bering Sea.
[b] Only in Bering Sea.

TABLE 51
(continued)

CONFIDENTIAL KODIAK (CITY) FISHERMEN BY SPECIES, GEAR TYPE, AND VESSEL SIZE 1975 - 1983

	YEAR								
Gear Type/ Species/ Vessel Size	1975	1976	1977	1978	1979	1980	1981	1982	1983
Salmon									
Purse Seine	0	1(E)	1	0	0	0	0	0	0
Beach Seine	0	0	1	0	0	0	0	0	0
Set Gillnet	0	1(T)	1(H)	0	0	0	0	0	0
Drift Gillnet	0	1(H)	2(E)	0	0	0	0	0	0
King crab									
≥ 50	0	0	0	0	0	1	0	0	0
Tanner crab									
≤ 50	0	0	0	1	0	0	1	0	0
≥ 50	0	1	1	5	8	5	4	3	3
Dungeness crab									
≤ 50	2	0	2	2	2	0	0	0	0
≥ 50	0	1	0	1	1	1	0	0	0
Herring (sac roe)									
Purse Seine	0	0	0	0	2	2	3	3	1(BB)
Gillnet	0	0	0	0	0	1	0	0	0
Herring (food/bait)	1	1	0	0	0	0	0	0	0
Shrimp									
Trawl	0	1	5	0	0	0	3	3	0
Pots	0	0	1	0	0	0	0	0	0

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SOURCE: CFEC

TABLE 52

TOTAL GROSS EARNINGS (CONFIDENTIAL AND INDIVIDUAL) OF KODIAK AREA FISHERMEN BY COMMUNITY, 1975-1983

(Thousands of Dollars)

COMMUNITY	YEAR								
	1975	1976	1977	1978	1979	1980	1981	1982	1983
Akhiok	-	$ 77.2	$ 76.8	$ 95.8	-	-	-	-	-
% of Total	-	2.3%	2.3%	1.8%	-	-	-	-	-
% of Grand	-	.2%	.1%	.1%	-	-	-	-	-
Total	0%	(.2%)	(.1%)	(.1%)	0%	0%	0%	0%	0%
Karluk	$ 57.4	$ 202.7	$ 134.6	$ 231.2	$ 27.6	$ 84.8	-	-	-
% of Total	4.5%	6.1%	4.1%	4.4%	.5%	1.7%	(0%)	(0%)	(0%)
% of Grand	.3%	.5%	.2%	.3%	*	.1%	-	-	-
Total	.3%	.5%	.2%	.3%	*	.1%	0%	0%	0%
Larsen Bay	$ 134.6	$ 188.6	$ 239.7	$ 370.1	$ 325.0	$ 286.6	$ 594.0	$ 155.1	$ 221.3
% of Total	10.6%	5.7%	7.4%	7.1%	6.3%	5.9%	8.2%	3.6%	7.1%
% of Grand	.7%	.45%	.4%	.4%	.3%	.3%	.6%	.2%	.4%
Total									
Old Harbor	$ 325.2	$ 1592.3	$ 1363.7	$ 1980.6	$ 2021.5	$ 2064.0	$ 3067.1	$ 1388.8	$ 1537.6
% of Total	27.7%	48.1%	42.0%	38.1%	39.2%	42.4%	42.4%	32.4%	49.1%
% of Grand									
Total	1.6%	3.8%	2.1%	2.3%	2.3%	2.3%	3.1%	1.6%	3.0%
Ouzinkie	$ 100.4	$ 613.4	$ 539.5	$ 801.6	$ 949.1	$ 1275.2	$ 410.3	$ 794.7	$ 500.6
% of Total	7.9%	18.5%	16.6%	15.4%	18.4%	26.2%	25.0%	18.5%	16.0%
% of Grand	.5%	1.4%	.8%	.9%	1.1%	1.4%	1.8%	.9%	1.0%
Total	.8%	1.5%	.8%	.9%	1.1%	1.4%	1.9%	.9%	1.0%
Port Lions	$ 592.7	$ 635.5	$ 891.0	$ 1716.9	$ 1829.3	$ 1156.2	$ 1767.1	$ 1951.6	$ 872.5
% of Total	46.7%	19.2%	27.5%	33.0%	35.5%	23.8%	24.4%	45.5%	27.9%
% of Grand	2.9%	1.5%	1.3%	2.0%	2.1%	1.3%	1.8%	2.3%	1.7%
Total	2.9%	1.5%	1.4%	2.0%	2.1%	1.3%	1.8%	2.3%	1.7%

Rural									
Subtotal	$ 1270.3	$ 3309.7	$ 3245.3	$ 5196.2	$ 5152.5	$ 4866.8	$ 7238.5	$ 4290.2	$ 3132.0
% of Grand									
Total	6.2%	7.8%	4.9%	6.0%	5.9%	5.4%	7.4%	5.0%	6.1%

Kodiak City	$19143.0	$39011.9	$62555.7	$81290.7	$81085.7	$85161.2	$90886.0	$81266.6	$48047.0
% of Grand									
Total	93.8%	92.2%	95.1%	94.0%	94.1%	94.6%	92.6%	95.0%	93.9%
Grand									
Total	$20413.3	$42321.5	$65801.0	$86486.9	$86238.2	$90028.0	$98124.5	$85556.8	$51112.8

* Trace

SOURCE: CFEC

Cultural Dynamics 1986

Total gross earnings (individual and confidential) of Kodiak city fishermen by species are presented in Table 53. The most valuable species taken from 1975 to 1982 was king crab. During that period king crab never provided less than a third of the total value. The peak contribution of 49.4% was reached in 1975 while the highest absolute contribution came in 1981 when $41,619,400 was earned from king crab. By 1983, however, contribution of the resource had dwindled to 18.2 percent of total earnings and only about $300,000 of the $8.35 million earned in that year came from the Kodiak management area.

During the study period tanner crab and salmon were about equal in their contribution to Kodiak fishermen's earnings. Tanner crab rose sharply in importance in 1982 and 1983 when king crab dropped sharply and salmon dipped substantially. In 1983, tanner crab was the most important species providing a little over a third of total gross earnings. Tanner crab earnings rose over the period from a low of $2.6 million in 1975 to a high of $24.5 million in 1982.

Salmon have been a steady if not spectacular contributor to Kodiak fishermen's earnings, typically providing about 20 percent of total value. Salmon peaked in value and contribution in 1981 when $24.4 million comprised 26.9 percent of total value. Pink salmon are the major source of earnings for purse seine and beach seine fishermen by a significant margin while set gillnet fishermen obtain nearly as much value on average from red salmon as from pink salmon. The relatively high proportion of red salmon in set gillnet fishermen's earnings is because certain areas in which they are allowed to operate by Board of Fisheries regulations are particularly well suited to harvesting red salmon. The Olga Bay-Moser Bay area, which is open only to set gillnet fishermen, is the best example.

Although the flush years of the western Alaskan shrimp fishery have been gone for about ten years, as recently as 1980 shrimp produced 10 percent of all fisheries earnings of Kodiak city fishermen. In the poor general fishing years of the mid-1970s, shrimp annually provided greater than 15 percent of total earnings. The peak value for the study period was reached in 1977 when $9.1 million was earned; the greatest contribution was made in 1975 when 18.7 percent of total earnings came from shrimp.

Although the foregoing occupied a preeminent position in the hierarchy of species pursued by Kodiak city fishermen over the past decade, with the exception of tanner crab, they have recently declined in importance. The declines have shifted importance to other resources including herring, halibut, dungeness crab, sablefish, as well as the major groundfish species--pollock and cod.

Herring (sac roe, food, and bait) was a relatively minor contributor over the study period, although its importance increased dramatically after 1978 when the 200-mile limit was adopted. Peak value was earned from sac roe herring in 1979 at $4.7 million but its proportional contribution was greatest in 1983 at 7.9 percent. A small but steady place has existed for bait herring and food herring has made a minor contribution as well.

TABLE 53
INDIVIDUAL (I) AND CONFIDENTIAL (C) TOTAL EARNINGS OF KODIAK CITY FISHERMEN BY SPECIES
1975 - 1983
(Thousands of Dollars)

SPECIES	YEAR								
	1975	1976	1977	1978	1979	1980	1981	1982	1983
Salmon(I)	$ 2968.0	$ 9622.0	$13723.4	$18160.9	$15846.4	$15233.6	$22577.6	$13628.1	$ 7666.6
Salmon(C)	$ 53.4	$ 50.8	$ 16.1	$ 945.9	$ 1038.3	$ 629.2	$ 1856.6	$ 466.1	$ 561.1
Salmon Subtotal	$ 3021.4	$ 9672.8	$13739.5	$19106.8	$16884.7	$15862.8	$24434.2	$14094.2	$ 8227.7
% of Total	(15.8%)	(24.8%)	(22%)	(23.5%)	(20.8%)	(18.6%)	(26.9%)	(17.3%)	(17.1%)
Halibut(I)	0	0	$ 497.4	$ 235.9	$ 496.2	$ 231.8	$ 722.0	$ 2118.0	NA
Halibut(C)	0	0	0	$ 51.7	$ 287.7	$ 66.8	$ 614.5	$ 634.6	NA
Halibut Subtotal	0	0	$ 497.4	$ 287.6	$ 783.9	$ 298.6	$ 1338.5	$ 2452.6	
% of Total	(0%)	(0%)	(.8%)	(.3%)	(1.0%)	(.3%)	(1.5%)	(3.4%)	
King crab(I)	$ 9103.3	$16660.5	$26171.1	$33151.0	$26946.4	$36855.0	$40121.1	$28587.8	$ 8353.8
King crab(C)	$ 362.8	$ 234.6	$ 327.8	$ 864.6	$ 1102.0	$ 2595.8	$ 1498.3	$ 2842.0	$ 392.2
King crab Subtotal	$ 9466.1	$16895.1	$26498.9	$34015.6	$28048.4	$39450.8	$41619.4	$31429.8	$ 8746.0
% of Total	(49.4%)	(43.3%)	(42.4%)	(41.8%)	(34.6%)	(46.3%)	(45.8%)	(38.7%)	(18.2%)
Tanner crab(I)	$ 2566.2	$ 5659.4	$11958.2	$17429.3	$21018.6	$15786.8	$11493.7	$23796.3	$15009.4
Tanner crab(C)	$ 63.0	$ 135.3	$ 77.4	$ 588.7	$ 489.7	$ 732.1	$ 783.6	$ 654.9	$ 1170.3
Tanner crab Subtotal	$ 2619.2	$ 5794.7	$12035.6	$18018.0	$21508.3	$16518.9	$12277.3	$24451.2	$16179.7
% of Total	(13.7%)	(14.8%)	(19.2%)	(22.2%)	(26.5%)	(19.4%)	(13.5%)	(30.1%)	(33.7%)

Continued next page

TABLE 53 (Continued)

(Thousands of Dollars)

SPECIES	YEAR								
	1975	1976	1977	1978	1979	1980	1981	1982	1983
Dungeness(I)	$ 304.0	-	-	$ 355.8	$ 444.7	$ 577.7	$ 1810.3	$ 1723.3	$ 3584.2
Dungeness(C)	-	$ 25.3	-	$ 323.6	$ 300.9	$ 173.2	$ 788.2	$ 566.1	$ 713.8
Dungeness Subtotal	$ 304.0	$ 25.3	-	$ 679.4	$ 745.6	$ 750.9	$ 2598.5	$ 2289.4	$ 4298.0
% of Total	(1.6%)	(.1%)	(0%)	(.8%)	(.9%)	(.9%)	(2.9%)	(2.8%)	(8.9%)
Herring Sac Roe(I)	-	-	-	$ 1450.5	$ 4068.3	$ 2647.4	$ 3172.0	$ 2261.7	$ 3670.8
Herring Sac Roe(C)	-	-	-	$ 229.8	$ 596.4	$ 159.1	$ 229.1	$ 412.8	$ 148.4
Herring Sac Roe Subtotal	-	-	-	$ 1680.3	$ 4664.7	$ 2806.5	$ 3401.1	$ 2674.5	$ 3819.2
% of Total	(0%)	(0%)	(0%)	(2.0%)	(5.7%)	(3.3%)	(3.7%)	(3.3%)	(7.9%)
Herring Bait(I)	-	-	-	$ 1.1	-	$ 12.3	-	$ 54.7	-
Herring Bait(C)	-	-	-	$ 205.5	$ 86.6	$ 12.0	-	$ 29.6	$ 6.8
Herring Bait Subtotal	-	-	-	$ 206.6	$ 86.6	$ 24.3	-	$ 84.3	$ 6.8
% of Total	(0%)	(0%)	(0%)	(.2%)	(.1%)	(*)	(0%)	(.1%)	(*)

Continued next page

TABLE 53 (continued)

(Thousands of Dollars)

SPECIES					YEAR				
	1975	1976	1977	1978	1979	1980	1981	1982	1983
Herring Food(I)	-	-	-	-	-	$ 23.7	$ 26.5	$ 34.1	-
Herring Food(C)	-	-	-	-	-	$ 12.5	-	$ 41.9	-
Herring Food Subtotal	-	-	-	-	-	$ 36.2	$ 26.5	$ 76.0	-
% of Total	(0%)	(0%)	(0%)	(0%)	(0%)	(*)	(*)	(.1%)	(0%)
Shrimp(I)	$ 3574.4	$ 6282.6	$ 9115.6	$ 6403.2	$ 6331.0	$ 8438.8	$ 3859.9	$ 2660.3	$ 206.1
Shrimp(C)	$ 10.5	-	-	$ 507.3	$ 1465.6	$ 597.6	$ 844.1	$ 587.9	$ 837.8
Shrimp Subtotal	$ 3584.9	$ 6282.6	$ 9115.6	$ 6910.5	$ 7796.6	$ 9036.4	$ 4704.0	$ 3248.2	$ 1043.9
% of Total	(18.7%)	(16.1%)	(14.6%)	(8.5%)	(9.6%)	(10.6%)	(5.2%)	(4.0%)	(2.2%)
Groundfish(I)	-	$ 53.5	$ 76.4	$ 212.6	$ 333.9	$ 106.4	$ 253.3	$ 655.3	$ 1195.3
Groundfish(C)	$ 13.3	$ 43.9	$ 69.4	$ 173.6	$ 232.9	$ 267.6	$ 235.0	$ 301.0	$ 930.8
Groundfish Subtotal	$ 13.3	$ 97.4	$ 145.8	$ 386.2	$ 466.8	$ 374.0	$ 488.3	$ 956.3	$ 2126.1
% of Total	(.1%)	(.2%)	(.2%)	(.5%)	(.6%)	(.4%)	(.5%)	(1.2%)	(4.4%)
Total(I)	$18640.0	$38522.0	$62065.0	$77400.0	$75485.6	$79915.3	$84036.6	$75528.7	$43285.8
Total(C)	$ 503.0	$ 489.9	$ 490.7	$ 3890.7	$ 5600.1	$ 5245.9	$ 6849.4	$ 5737.9	$ 4761.2
Grand Total	$19143.0	$39011.9	$62555.7	$81290.7	$81085.7	$85161.2	$90886.0	$81266.6	$48047.0

SOURCE: CFEC

Halibut have assumed substantial importance to Kodiak fishermen as they rose in the 1980s from less than $300,000 and .3 percent of total value to $2.5 million and 3.4 percent. Preliminary estimates suggest that halibut was worth about $70 million to Kodiak fishermen in 1983, perhaps topping 15 percent of total value.

Dungeness crab have been a natural for increased exploitation by the small boat fleet thanks to their ready availability in nearshore waters. Landings of dungeness crab rose from $304,000 and .3 percent in 1978 to $4.3 million and 8.9 percent of total value in 1983.

Sablefish have not been broken out as a separate species in the CFEC data. Nevertheless, this resource assumed an important position in 1984 and 1985 as another in the species needed to replace lost king crab earnings. As recently as 1983 the overwhelming majority of sablefish were taken by Japanese longliners in the Kodiak and Chirikof districts. However, by mid-1984 U.S. fishermen, primarily from Kodiak, had increased their efforts so quickly that no resource remained for the foreigners.

The final species group to emerge and increase in importance to Kodiak area fishermen are the groundfish species, primarily cod and pollock. These species have witnessed a steady increase over the study period from $13,100 and .1 percent of total value in 1975 to over $2 million and 4.4 percent in 1983. These figures are only completely domestic catches and do not include the joint venture fisheries which expanded rapidly in 1983 and 1984. As will be discussed in greater detail below, Kodiak fishermen have been at the cutting edge both in politics and on the fishing grounds in creating joint venture opportunities, particularly on the massive Shelikof Strait pollock stocks.

Average gross earnings received by Kodiak fishermen over the study period for various species are presented in Table 54. Earnings from only Kodiak area waters are included. It must be remembered that Kodiak fishermen have made substantial additional earnings in the Chignik purse seine fishery, the Bristol Bay sac roe herring purse seine fishery, and the king and tanner crab fisheries of the Bering Sea. This table also indicates the growth (and decline) in the number of Kodiak city fishermen pursuing different species through the years.

In the salmon fisheries, 1981 was the peak year for Kodiak residents of all three gear types--purse seine fishermen averaged gross earnings of $62,400, beach seine fishermen $27,000 and set gillnet fishermen $33,000. Earnings dropped sharply in all three fisheries in 1982 and a took a further fall in 1983. Although the numbers of purse seine and beach seine fishermen have fallen since peaking in 1980, the number of set gillnet fishermen did not peak (at 132) until 1982. Despite the recent declines, the overall trend from 1975 to 1982 was one of substantial increase in the numbers of Kodiak residents using each salmon gear type. This was accomplished through three processes--migration of gear holders to Kodiak from other communities, transfer of permits to Kodiak residents from residents of other communities, and activation of permits that were not used in earlier years.

TABLE 54

AVERAGE GROSS EARNINGS FROM KODIAK AREA WATERS OF KODIAK CITY FISHERMEN BY SPECIES AND GEAR TYPES, 1975-1983

Species	1975		1976		1977		1978		1979		1980		1981		1982		1983	
Vessel Size Gear Type (Area K)	n	Mean	n	Mean	n	Mean	n	Mean	n	Mean	n	Mean	n	Mean	n	Mean	n	Mean
Salmon																		
Purse Seine	142	$13.8	158	$41.7	157	$46.0	176	$66.2	189	$45.4	199	$50.6	182	$62.4	186	$33.8	180	$26.0
Beach Seine	6	$6.2	9	$14.0	15	$9.2	16	$15.7	15	$16.6	22	$18.1	19	$27.0	15	$10.5	12	$7.7
Set Gillnet	65	$3.9	92	$12.0	76	$18.2	77	$20.7	94	$19.7	103	$18.2	103	$33.0	132	$21.8	130	$13.2
King Crab																		
50' Or Less	70	$24.2	88	$26.6	105	$25.7	91	$27.3	101	$25.1	45	$58.8	92	$74.6	99	$40.2	—	—
Over 50'	122	$52.0	77	$100.8	95	$124.8	108	$124.9	160	$79.1	135	$126.4	167	$193.5	189	$126.8	7	$14.1
Subtotal	192	$41.9	165	$61.2	200	$72.8	199	$80.3	261	$58.2	180	$109.5	259	$151.3	288	$97.0	7	$14.1
Tanner Crab																		
50' Or Less	39	$16.4	44	$20.0	57	$41.2	72	$55.7	85	$50.4	52	$41.1	66	$25.0	61	$44.6	96	$28.6
Over 50'	75	$22.5	60	$61.0	59	$100.4	92	$118.1	105	$113.8	143	$66.6	115	$59.8	134	$145.6	145	$82.9
Subtotal	114	$20.4	104	$43.7	116	$71.3	164	$90.7	190	$85.4	195	$59.8	181	$47.1	195	$114.0	291	$61.3
Dungeness Crab																		
50' Or Less	6	$29.1		(1)		(1)	17	$20.9	7	$32.1		(1)	23	$45.9	54	$18.0	56	$28.1
Over 50'	7	$18.5		(1)		(1)		(1)	4	$55.0	9	$64.2	9	$83.7	16	$23.8	26	$75.8
Subtotal	13	$23.4		(1)		(1)	17	$20.9	11	$40.4	9	$64.2	32	$56.5	70	$19.3	82	$43.2
Halibut		NA		NA	92	$3.6	90	$2.3	114	$3.6	141	$1.4	219	$3.1	246	$6.9		NA
Shrimp																		
Otter Trawl	40	$32.6	24	$42.2	23	$45.3	11	$59.6	10	$77.4	28	$64.2	6	$56.5	4	$40.6	4	$51.5
Beam Trawl	14	$11.5	10	$20.0	7	$52.9	—	—	4	$16.0	4	$53.0	—	—	—	—	—	—
Other	29	$48.1	38	$58.2	46	$52.7	29	$67.7	21	$112.3	43	$120.8	40	$85.6	25	$93.6	—	—
Subtotal	83	$34.5	72	$47.6	76	$50.5	40	$65.5	35	$91.3	75	$96.0	46	$81.8	29	$86.3	4	$51.5
Herring																		
PS General	—	—	—	—	9	$15.4	—	—	—	—	—	—	—	—	—	—	—	—
PS Sac Roe	—	—	—	—	—	—	20	$11.0	40	$43.5	59	$16.9	54	$7.1	31	$15.6	29	$30.2
PS Food/Bait	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
GN Sac Roe	—	—	—	—	—	—	—	—	65	$2.2	86	$1.2	69	$1.2	42	$2.3	49	$5.9
GN Bait	—	—	—	—	—	—	5	$.2	—	—	—	—	—	—	—	—	—	—
Groundfish																		
Longline	—	—	10	$.7	7	$.8	—	—	—	—	—	—	—	—	—	—	—	—
Otter Trawl	—	—	11	$2.4	12	$2.8	—	—	10	$.2	6	$15.6	9	$17.0	16	$41.0	28	$42.5
Other Trawl	—	—	9	$1.2	14	$1.7	11	$17.3	27	$11.6	—	—	4	$25.0	—	—	—	$42.5

(1) Confidential Earnings Only

PS=Purse Seine
GN=Gill Net

SOURCE: CFEC

Substantial fluctuations are apparent in the number of king crab fishermen, using both large and small vessels, harvesting from year to year during the study period. The general tendency, however, is one of an increase, growing by about 50 percent from 192 fishermen in 1975 to 288 in 1982. Growth is greater among fishermen using larger vessels than among those using smaller vessels. Growth in the number of individual fishermen (data in this table) should not be assumed to represent a similar increase in vessels since it is often the case that more than one person will captain larger vessels during the course of a crab season, and thus sign fish tickets recording earnings under separate names.

Earnings for king crab fishermen were highest in 1981 when those on small vessels averaged gross earnings of $74,600 and fishermen on large vessels averaged $193,500. By 1983, only seven Kodiak city resident fishermen harvested king crab, all with large vessels.

The tanner crab fishery experienced growth similar to that of king crab over the study period. However, the number of fishermen in tanner crab was only about 60 percent of the number in king crab and, although the number of tanner crab fishermen increased sharply in 1983 to 241 from a previous high of 195, the number of Kodiak city tanner crab fishermen did not surpass the king crab top figure of 288. Small boat fishermen generally average between 25 and 40 percent of large boat mean gross earnings. The size of the vessel influenced when peak average earnings were realized. Small boat fishermen earnings were highest in 1979 when 72 fishermen had mean gross tanner crab earnings of $55,700. For the larger vessels, earnings were greatest in 1982 when 134 fishermen averaged $145,600. In general, small boat fishermen average between 40 and 60 percent of large boat gross earnings.

Between 1975 and 1981, the number of dungeness crab fishermen did not exceed 20 in any year. Substantial growth occurred in each of the following three years, particularly in the small boat class from 1981 to 1982. As noted earlier, total earnings from dungeness crab increased fivefold from 1979 to 1983. Large and small vessel fishermen both reached highest average gross earnings in 1981 at $83,700 and $45,900 respectively. Additional entrants into the fishery appear to be decreasing average earnings somewhat.

Both the number of halibut fishermen and their average gross earnings increased, with the sharpest rise occurring in 1982 when 246 fishermen accrued average earnings of $6,900. A significant portion of the new entry into the halibut fishery resulted from the North Pacific Fishery Management Council's discussion of the possibility of limiting entry. The number of Kodiak city fishermen harvesting halibut increased again in 1983 but appears to have declined in 1984 when the threat of limited entry was eliminated by the Department of Commerce's refusal to implement a moratorium on the fishery.

The number of shrimp fishermen has declined drastically over the study period from a peak of 83 fishermen in 1975 to a low of only four in 1983.

Peak earnings were realized in 1980 when 75 fishermen averaged $96,000. Following the decline of shrimp stocks, many shrimp fishermen shifted to dragging for groundfish and some converted to crab fishing.

The sac roe herring fishery began in 1978 for purse seine fishermen and in 1979 for gillnet fishermen. For both gear types, maximum numbers occurred in 1980 and have dwindled to roughly half that level since that time. Mean gross earnings in the purse seine fishery was highest in 1979 when 40 fishermen had an average gross of $43,500 while high earnings in the gillnet fishery did not occur until 1982 when 42 fishermen had average gross earnings of $2,300.

Groundfish effort and earnings increased substantially from six fishermen with average earnings of $15,600 in 1980 to 28 fishermen with average gross earnings of $42,700 in 1983. The data base does not capture the dramatic movement of Kodiak fishermen into sablefish; in 1984 over 50 Kodiak city fishermen commercially harvested sablefish, the vast majority of whom used longline gear.

The fisheries classified as confidential which Kodiak fishermen pursued over the study period are presented in Table 51. The largest number of confidential cases are found in the large boat tanner crab fishery from 1978 to 1981. This results from these fishermen pursuing the opilio species of tanner crab in the Bering Sea thus introducing an additional break in tanner crab data.

The confidential earnings of Kodiak city fishermen were presented in Table 53. Over the study period the amount of confidential earnings has increased from less than 3 percent of all earnings in 1975 to 11 percent in 1983. This is largely the result of an increasingly diversified fleet pursuing a variety of different species in different parts of the state. Generally, the absolute amount of confidential earnings is proportional to the total amount of earnings from a given species (king crab, tanner crab, salmon). However, species which fewer fishermen have harvested and have lower total values tend to have a high proportion of earnings classified as confidential (dungeness crab, groundfish).

Kodiak city fishermen range widely over waters of the Gulf of Alaska and the Bering Sea to harvest this wide array of species. Table 55 indicates the management areas from which Kodiak fishermen have obtained their earnings. For purposes of this analysis, areas have been subdivided into Kodiak, Chignik, and other--the latter category includes all other areas of Alaska. Kodiak city fishermen have on average taken about 70 percent of their earnings from the Kodiak management area, about 5 percent from the Chignik management area (this is actually only salmon earnings since Chignik crab and shrimp earnings are classified as other), and about 25 percent from other parts of the state. The most important other fisheries that they used during the study period are Chignik shrimp and tanner crab, Alaska Peninsula shrimp, Dutch Harbor and Bering Sea king and tanner crab, and Bristol Bay purse seine sac roe herring.

TABLE 55

TOTAL EARNINGS OF KODIAK FISHERMEN BY MANAGEMENT AREA, 1975 - 1983

(Thousands of Dollars)

MANAGEMENT AREA	YEAR									
	1975	1976	1977	1978	1979	1980	1981	1982	1983[1]	Avg.
Kodiak	15781.1	25937.6	37393.9	47955.3	48354.9	52981.4	69949.5	66285.3	27492.2	
% of Total	(84.7%)	(67.3%)	(60.2%)	(62%)	(64.1%)	(66.3%)	(83.2%)	(87.8%)	(63.5%)	69.3%
Chignik	534.5	1623.9	4565.7	4205.5	3778.3	2156.9	5311.4	2951.3	2394.9	
% of Total	(2.9%)	(4.2%)	(7.4%)	(5.4%)	(5.0%)	(2.7%)	(6.3%)	(3.9%)	(5.5%)	5.0%
Other	2324.4	10960.6	20105.9	25239.2	23352.4	24866.9	8775.7	6291.2	13398.7	
% of Total	(12.5%)	(28.5%)	(32.4%)	(32.6%)	(30.9%)	(31.0%)	(10.5%)	(8.3%)	(31.0%)	25.7%
Total	18640.0	38522.0	62065.6	77400.0	75485.6	79915.3	84036.6	75528.7	43285.8	

[1] No halibut.

Cultural Dynamics

SOURCE: CFEC

It might be expected that the proportion of Kodiak city fishermen's earnings being derived from other parts of the state would have increased during the study period since the number of fishermen increased and the fisheries they pursued diversified. This does not appear to have occurred because already in 1975 Kodiak city fishermen were actively pursuing shrimp in the Alaska Peninsula and Chignik areas as well as king crab in the Dutch Harbor and Bering Sea areas. What does seem to have happened is that Kodiak city fishermen have increased their proportion of harvest from the Kodiak area, and they have increased their earnings from other areas. The net effect is to keep relatively constant the proportions of total earnings taken from the Kodiak area and the other areas.

One final note of importance is that in years when resources are abundant in the Kodiak area, Kodiak city fishermen stay home and take a larger portion of their earnings from local waters. Because they fish more in Kodiak area waters in good years, however, does not mean that they take a larger percentage of the resources in Kodiak waters apparently because the resource abundance attracts other fishermen to the area as well. The converse also is true--in years when Kodiak area resources are not abundant, a larger proportion of Kodiak city fishermen's earnings are taken from other areas.

No additional information is available on costs and net earnings of Kodiak city fishermen beyond that provided for the regional level in the earlier harvesting sector discussion.

Relationships between processors and Kodiak city fishermen have changed in major ways in the past decade. Limited entry, increased salmon runs and increased earnings in the king crab fishery have allowed fishermen to become independent vessel owners. This was accomplished in several ways--the highline fishermen were able to establish direct financial relationships with commercial banks in Alaska and Washington. State programs became a major source of loans from 1977 to 1980 and opened up new vistas of financial opportunity. While private institutions are leery about providing loans on fishing vessels for more than five years, the State was able to provide terms up to 15 years and lower than market rates of interest. Initially pegged at 7.5 percent in 1976 the rates were raised to 9 percent in 1978 and 10 percent in 1979. In 1979, a further invitation to new vessel purchase was proffered when the State began allowing limited entry permits to be used as collateral for state loans. The state loan programs were a major factor in upgrading and dramatically expanding the Kodiak fleet in the period from 1975 to 1980.

Another important program contributing to vessel purchases was the federal Capital Contruction Fund (CCF). When it was conceived in the early 1970s, this program was designed to help modernize the American fishing fleet. Fishermen were allowed to shelter commercial fishing earnings from taxation by placing them into the fund. Interest on the money was also sheltered as long as it remained in the CCF. The key element in the program was that these funds were to be used as tax free investments in new vessels. Many Kodiak fishermen were able to use this program and a few ambitious highliners used the fund to purchase a second crab fishing vessel. The collapse of king crab in 1983 has had a substantial negative impact on those fishermen who extended themselves precariously into additional vessel purchases through use of the Capital Construction Fund.

In 1980, the Commercial Fisheries and Agricultural Bank (CFAB) was established and initially funded with state revenues; CFAB quickly assumed the major share of new vessel and gear loans. This combinaion of institutions resulted in the virtual elimination of processors as the source of vessel financing. The programs made financing available to the vast majority of fishermen in the state and Kodiak fishermen led the charge on the coffers to take advantage of the king crab boom.

Whereas individual fishermen were able to purchase vessels in the smaller range from 35-60 feet, newer arrangements were needed for the purchases of vessels larger than 80 feet. In some cases independent vessels owners joined together to buy the larger vessels. In other cases a fishermen might go in with his crewmen, while in still others a fishermen would seek partners from other professions. A new cooperative relationship among some fishermen and processors also emerged as the firm and the fishermen on occasion became partners, co-owners, in a vessel.

This new, more cooperative relationship between processor and fishermen seems to have resulted in a mutually beneficial situation for both parties. Fishermen still require a wide variety of services to keep their vessels productive, and although many of these can be provided by independent firms, making arrangements can be time consuming and costly. By packaging together tendering contracts, a better price for product, a guaranteed market, gear storage, vessel maintenance, spare parts, and lower gear costs, processors continue to be an attractive alternative to strict and total independence. Processors attempt to piece together a small group of fishermen who will be loyal highline producers in order to assure themselves a supply of product. This mutual symbiosis has led to close relationships between processors and their select group of fishermen that tend to endure over many years. One processor termed the group a "family" implying a whole host of mutual responsibilities between fishermen and processor. The effect of this new structural relationship is to provide some fishermen with a guaranteed market for their products, especially important for those fishermen trying to enter groundfishing by delivering cod to local plants. Fishermen not in such relationships must constantly be on the search for firms in need of product.

Some fishermen have taken a further step and have tried to become processors themselves. The largest and most recent example of this was the formation of a group of 37 Kodiak fishermen along with other local investors to purchase and operate, with a CFAB loan, a salmon canning operation at Uganik Bay. This enterprise, begun in 1983, has not been successful because of a variety of factors including a soft market for canned salmon and failure of the owner-fishermen to sell to their own cannery. In early 1985 CFAB foreclosed on the group for failure to make loan payments.

Another model of fishermen becoming processors that is gaining in popularity is the conversion of large crab vessels into catcher-processors. There were at least five of these vessels owned by Kodiak residents in 1985. Generally freezers and a filleting machine to process cod and sablefish have been installed on board. This adaptation sometimes requires fishermen to become fish brokers as well as harvesters and processors if they are unable to find a more conventional shore-based processor interested in buying or brokering their vessel-processed product for them.

The number and diversity of commercial fishing enterprises based in Kodiak also is apparent in the patterns of crewing in the fisheries. The most traditional pattern of domestic mode of production is found in the salmon fisheries where family, kinsmen, and friends are often employed as crewmen. The absolute frequency of this in Kodiak city is probably lower than in the villages because Kodiak fishermen are immigrants who lack the large extended families of rural Native fishermen.

Salmon purse seine vessels employ from two to five persons in addition to the captain. Beach seine operations are normally smaller with two or three people in addition to the captain. Set gillnetting has the fewest people involved typically with only one person assisting the permit holder/captain. The number of crewmen involved in crabbing depends on the size of the vessel. Smaller vessels under 50 feet in length typically employ two or three individuals in addition to the captain. On larger vessels the range is from three to five and even more on Bering Sea crabbers over 100 feet in length. Shrimpers and draggers normally have a crew of three or four in addition to the captain. The larger crabbers and draggers require a more specialized and skilled crew than do the smaller limit and pocket seine vessels. In particular a position for a skilled mechanic is typically available on these vessels to insure the proper functioning of the engines.

The openness and expansiveness of the Kodiak fisheries in the past decade has allowed tremendous mobility for crewmen entering the community. The well-known novel of Kodiak fishing life, Highliners, by William McCloskey (1979), is based on the theme of a young man in his twenties coming to the community, making enough from crewing to purchase his own boat, and then going on to become successful in the crab fishery. As a regional center, Kodiak has long attracted to its docks single, young males in pursuit of summer employment on fishing boats. The tales in the late 1970s of crewshares upwards of $30,000 made the community even more of a magnet for young men seeking their fortune. The bars and docks teemed with bodies hoping to be the lucky ones to obtain a berth on a king crab fishing vessel. The availability of a substantial reserve labor force of unemployed meant that the labor market was highly competitive. In the crab fisheries, the intensity, danger and high earnings in the fishery led to rapid turnover and many opportunities. In the shrimp fisheries, on the other hand, more stability appears to have been characteristic as a result of the longer season and the slower rate of income production. Draggers tend to have relatively stable crews with several positions filled by persons with longstanding ties to the owner or captain and only one or two positions for others.

Kodiak Island Villages

The total earnings, individual and confidential, of Kodiak village fishermen from 1975 to 1983 by species are presented in Table 56.

Akhiok

The village of Akhiok located on the southwest corner of Kodiak Island is the closest community to the rich red salmon fisheries of Olga and Moser Bay, is in close proximity to king and tanner crab grounds in Alitak Bay and Alitak Flats, and is also close to productive halibut banks off the Trinity Islands (Fig. 1). Unfortunately, the community is situated on an exposed bluff lacking both an anchorage and a sheltered harbor for the protection of fishing vessels. Both subsistence and commercial fisheries in the area are now prosecuted from skiffs. In the past residents from Akhiok fished set gillnet sites in Olga and Moser Bay, but sale of limited entry permits and their accompanying rights to the productive red salmon sites has nearly eliminated this important source of commercial fishing income from the local economy.

The number of fishermen in Akhiok over the study period is presented in Table 49. No more than three persons recorded commercial fishing landings during the study period consequently only confidential, community-level data are available. According to Table 49, no one in Akhiok made commercial fishing landings after 1982. Fieldwork in the community indicates that two purse seine permits are still held by Akhiok residents but lack of vessels has prevented their use in recent years.

Table 51 indicates that Akhiok residents exploited only salmon fisheries during the study period. Set gillnet was the most consistently pursued gear type which three persons used in 1978, but which was last used in 1980. A single purse seine permit was fished in five years during the study period, and it was the last fished in 1981. A single beach seine permit was fished in 1975 then sold. Table 56 shows total salmon earnings of individually reported fishermen. These data show a wide variation--the 1979 figure is ten times greater than either of the two previous years. This suggest the possibility of anomalous reporting procedures for Akhiok in that particular year. Table 50 reveals the CFEC reported confidential earnings to Akhiok during the study period. Despite the fact that the confidential fisheries data indicates commercial fisheries occurring from 1975 to 1981, earnings are only reported for 1976 to 1978; the largest confidential earnings reported occurred in 1978 when $95,800 was taken in from salmon sales. The domestic mode of production was used for commercial fishing in Akhiok when it was being done. No data is available on the relationship of Akhiok fishermen to processors. Several Akhiok men have been crewmen on Old Harbor fishing vessels in the last several years.

TABLE 56

TOTAL GROSS EARNINGS OF KODIAK VILLAGE FISHERMEN BY COMMUNITY AND SPECIES, 1975-1983

(Thousands of Dollars)

COMMUNITY/ SPECIES					YEAR				
	1975	1976	1977	1978	1979	1980	1981	1982	1983
Akhiok									
Salmon(C)	-	$ 77.2	$ 76.8	$ 95.8	-	-	-	-	-
Karluk									
Salmon(I)	$ 57.4	$ 202.7	$ 112.0	-	-	-	-	-	-
Salmon(C)	-	-	22.6	$ 231.2	$ 27.6	$ 84.8	-	-	-
Total	$ 57.4	$ 202.7	$ 134.6	$ 231.2	$ 27.6	$ 84.8	0	0	0
Larsen Bay									
% of Total	(100%)	(100%)	(100%)	(98.6%)	(93.4%)	(99.4%)	(98%)	(81%)	(87.7%)
Salmon (I)	$ 134.6	$ 188.8	$ 227.9	$ 232.1	$ 182.7	$ 214.6	$ 454.6	$ 25.8	$ 53.8
Salmon (C)	0	*	11.8	132.6	120.7	70.0	127.2	112.2	140.3
Subtotal	$ 134.6	$ 188.8	$ 239.7	$ 364.7	$ 303.4	$ 284.6	581.8	$ 138.0	$ 194.1
% of Total				(1.4%)	(6.6%)	(.6%)	(2%)	(2%)	(12.3%)
Halibut (I)	0	0	0	$ 5.3	$ 12.7	0	$ 12.2	$ 12.1	$ 14.6
Halibut (C)	0	0	0	0	8.9	1.8	0	5.0	12.6
Subtotal	0	0	0	$ 5.3	$ 21.5	$ 1.8	$ 12.2	$ 17.1	$ 27.2
Total	$ 134.6	$ 188.8	$ 139.7	$ 370.0	$ 325.0	$ 286.4	$ 594.0	$ 155.0	$ 221.3
Old Harbor									
% of Total	(83.1%)	(96.9%)	(100%)	(100%)	(84.6%)	(3.4%)	(95.9%)	(70.1%)	(56.6%)
Salmon(I)	$ 270.1	$1542.3	$1363.7	$1976.6	$1332.8	$1615.7	$2791.7	$ 775.5	$ 835.2
Salmon(C)	-	-	-	$ 4.0	$ 376.7	$ 313.2	$ 149.7	$ 197.9	$ 35.2
Subtotal	$ 270.1	$1542.3	$1363.7	$1980.6	$1709.5	$1928.9	$2941.4	$ 973.4	$ 870.4
King crab(I)	$ 55.1	0	0	0	$ 77.2	0	$ 87.6	$ 77.8	0
King crab(C)	0	0	0	0	0	0	0	0	0
Subtotal	$ 55.1	0	0	0	$ 77.2	0	$ 87.6	$ 77.8	0
% of Total	(16.9%)				(3.8%)		(2.9%)	(5.6%)	
Tanner(I)	0	0	0	0	0	0	0	0	$ 89.3
Tanner(C)	0	0	0	0	$ 234.8	$ 105.6	0	$ 162.7	0
Subtotal	0	0	0	0	$ 234.8	$ 105.6	0	$162.7	$ 89.3
% of Total					(11.6%)	(5.1%)		(11.7%)	(5.8%)

Continued next page

TABLE 56

TOTAL GROSS EARNINGS OF KODIAK VILLAGE FISHERMEN (Continued)
BY COMMUNITY AND SPECIES, 1975-1983
(Thousands of Dollars)

COMMUNITY/ SPECIES	YEAR 1975	1976	1977	1978	1979	1980	1981	1982	1983
Herring Sac Roe(I)	0	0	0	0	0	$ 29.5	$ 38.1	0	$ 304.0
Herring Sac Roe(C)	0	0	0	0	0	-	-	$ 174.9	$ 273.7
Subtotal	0	0	0	0	0	$ 29.5	$ 38.1	$ 174.9	$ 577.7
% of Total						(1.4%)	(1.2%)	(12.6%)	(37.6%)
Total(I)	$ 325.2	$1592.3	$1363.7	$1976.6	$1410.0	$1645.2	$2917.4	$ 853.3	$1228.7
Total(C)	0	0	0	$ 4.0	$ 611.5	$ 418.8	$ 149.7	$ 535.5	$ 08.9
GRAND TOTAL	$ 325.2	$1592.3	$1363.7	$1980.6	$2021.5	$2064.0	$3067.1	$1388.8	$1537.6
Ouzinkie									
Salmon(I)	$ 160.4	$ 507.6	$ 506.6	$ 670.5	$ 469.1	$ 848.9	$ 702.6	$ 272.1	$ 296.1
Salmon (C)	-	-	-	-	$ 175.9	$ 14.5	$ 343.6	$ 135.2	$ 23.1
Subtotal	$ 160.4	$ 507.6	$ 506.6	$ 670.5	$ 645.0	$ 863.4	$1046.2	$ 407.3	$ 319.2
% of Total	(100)	(82.7%)	(93.9%)	(83.6%)	(68%)	(67.7%)	(57.8%)	(51.2%)	(63.8%)
Halibut(I)	0	0	$ 26.8	$ 13.8	$ 14.8	$ 36.1	$ 88.3	$ 25.5	NA
Halibut(C)	0	0	$ 6.0	$ 15.1	$ 42.7	$ 8.0	$ 21.0	$ 20.9	NA
Subtotal	0	0	$ 32.8	$ 28.9	$ 57.5	$ 44.1	$ 109.3	$ 46.4	NA
% of Total			(6.1%)	(3.6%)	(6.1%)	(3.5%)	(6.0%)	(5.8%)	
King crab(I)	0	$ 105.8	0	0	$ 53.8	0	0	$ 61.7	0
King crab(C)	0	-	0	$ 102.1	-	$ 242.6	$ 527.1	-	0
Subtotal	0	$ 105.8	0	$ 102.1	$ 53.8	$ 242.6	$ 527.1	$ 61.7	0
% of Total		(17.3%)		(12.8%)	(5.7%)	(19%)	(29.1%)	(7.8%)	(0%)
Tanner(I)	0	0	0	0	0	0	0	0	$ 33.3
Tanner(C)	0	0	0	0	$ 192.8	$ 125.1	$ 127.7	$ 279.4	$ 148.1
Subtotal	0	0	0	0	$ 192.8	$ 125.1	$ 127.7	$ 279.4	$ 181.4
% of Total					(20.3%)	(9.8%)	(7.0%)	(39.2%)	(36.2%)
Total(I)	$ 160.4	$ 613.4	$ 533.5	$ 684.4	$ 537.7	$ 885.0	$ 790.9	$ 359.2	$ 329.4
Total(C)	0	0	$ 6.0	$ 117.2	$ 411.4	$ 390.2	$1019.4	$ 435.5	$ 171.2
GRAND TOTAL	$ 160.4	$ 613.4	$ 539.5	$ 801.6	$ 949.1	$1275.2	$1810.3	$ 794.7	$ 500.6

Continued next page

TABLE 56

TOTAL GROSS EARNINGS OF KODIAK VILLAGE FISHERMEN (Continued) BY COMMUNITY AND SPECIES, 1975-1983

(Thousands of Dollars)

COMMUNITY/ SPECIES	YEAR								
	1975	1976	1977	1978	1979	1980	1981	1982	1983
Port Lions									
Salmon(I)	$ 130.9	$ 353.6	$ 367.1	$ 438.2	$ 542.3	$ 490.0	$ 527.0	$ 171.8	$ 198
Salmon(C)	0	0	0	$ 12.6	$ 87.5	$ 15.2	$ 8.1	$ 254.8	$ 68.4
Subtotal	$ 130.9	$ 353.6	$ 367.1	$ 450.8	$ 629.8	$ 505.2	$ 535.1	$ 426.6	$ 266.4
% of Total	(22.1%)	(55.6%)	(91.2%)	(26.3%)	(34.4%)	(43.7%)	(30.3%)	(21.9%)	(30.5%)
Halibut(I)	0	0	$ 27.3	$ 23.2	$ 27.3	$ 19.9	$ 33.9	$ 19.9	NA
Halibut(C)	0	0	$ 9.1	$ 6.5	$ 33.7	$ 12.8	$ 29.8	$ 10.5	NA
Subtotal	0	0	$ 36.4	$ 29.7	$ 61.0	$ 32.7	$ 63.7	$ 30.4	
% of Total			(4.1%)	(1.7%)	(3.3%)	(2.8%)	(3.6%)	(1.6%)	
Herring Sac Roe(I)	0	0	0	0	0	0	0	$ 5.6	$ 21.3
Herring Sac Roe(C)	0	0	0	0	$ 151.0	$ 31.4	$ 45.8	$ 72.0	$ 296.2
Subtotal	0	0	0	0	$ 151.0	$ 31.4	$ 45.8	$ 77.6	$ 317.5
% of Total					(8.2%)	(2.7%)	(2.6%)	(4.0%)	(36.4%)
King crab(I)	$ 454.4	$ 205.8	$ 148.6	$ 71.4	$ 53.3	$ 325.8	$ 212.3	$ 407.8	0
King crab(C)	0	0	0	$ 761.0	$ 599.5	0	$ 740.5	$ 436.2	0
Subtotal	$ 454.4	$ 205.8	$ 148.6	$ 832.4	$ 652.8	$ 325.8	$ 952.8	$ 844.0	0
% of Total	(76.7%)	(32.4%)	(16.7%)	(48.5%)	(35.7%)	(28.2%)	(53.9%)	(43.2%)	
Tanner(I)	$ 7.3	$ 76.1	$ 338.8	$ 90.8	$ 159.5	$ 89.2	$ 47.3	$ 276.9	$ 97.0
Tanner(C)	0	0	0	$ 313.3	$ 175.3	$ 171.9	$ 122.5	$ 296.2	$ 162.5
Subtotal	$ 7.3	$ 76.1	$ 338.8	$ 404.1	$ 334.8	$261.1	$ 169.8	$ 573.1	$ 259.5
% of Total	(1.2%)	(12%)	(38%)	(23.5%)	(18.3%)	(22.6%)	(9.6%)	(29.4%)	(29.7%)
Total(I)	$ 592.7	$ 635.5	$ 881.9	$ 623.5	$ 782.3	$ 924.9	$ 820.4	$ 881.9	$ 317.1
Total(C)	0	0	$ 9.1	$1093.4	$1047.0	$ 231.3	$ 946.7	$1069.7	$ 555.4
GRAND TOTAL	$ 592.7	$ 635.5	$ 891.0	$1716.9	$189.3	$1156.2	$1767.1	$1951.6	$ 872.5

SOURCE: CFEC

Cultural Dynamics 1986

Karluk

Located at the mouth of the Karluk River, the most prolific red salmon producing system in the Kodiak management area, the community of Karluk would appear to be ideally situated for participation in the salmon fisheries. The number of residents of Karluk who have made commercial salmon landings, however, declined dramatically during the period from 1975 to 1983.

Table 49 indicates that a maximum of 11 individual fishermen from Karluk were reported in 1976; this dropped to a confidential level of only two fishermen in 1980. It is noteworthy that there were no commercial fishermen, either individual or confidential, reported from Karluk in 1978. This was the year when a huge storm devastated the village and apparently disrupted community life so much that the commercial salmon fishery did not occur. The drop of fishermen since 1979 is in part the result of the movement of a number of Karluk residents to Larsen Bay after the storm. Salmon provide 100 percent of total earnings (Table 56); as might be further expected, reds make up the majority of the harvest and earnings of Karluk fishermen. The percentage is higher for the beach seine fishermen than for the purse seine fishermen. There is little evidence of any effort toward diversification among Karluk fishermen. Table 51 indicates a spotty involvement with halibut in the late 1970s but, as Table 56 indicates, no earnings from halibut were reported by CFEC. There is no apparent involvement with any crab fishery or sac roe herring fishery.

Individual earnings for Karluk fishermen reported in Table 52 are from purse seine gear only in 1975 and 1977. In 1978, seven of the 11 cases are purse seine fishermen and the other four are from beach seine fishermen. With exception of 1975, the average earnings of Karluk fishermen were the lowest for any community in the Kodiak area. The maximum average earnings were realized in 1977 when Karluk residents averaged a gross of $22,400; this was $15,000 less than the next nearest community average. From 1978 on, Table 51 indicates that the remaining two confidential fishermen in Karluk used beach seine gear. Either the purse seine fishermen sold their permits or moved to Larsen Bay after 1978.

Table 52 presents total earnings, both individual and confidential, received by residents of Kodiak area communities. This table reports additional confidential earnings for Karluk from 1977 through 1980 residents. The community's maximum earnings from commercial fishing were reached in 1978 when a total of $231,200 was paid to Karluk fishermen. This figure represents 4.8 percent of all rural Kodiak fisheries earnings and .3 percent of all Kodiak area resident fishermen's earnings.

No data are available on relationships with processors or crew patterns for Karluk. It is likely that the domestic mode of production continues to be used for the remaining small scale beach seine efforts which occur.

Larsen Bay

The community of Larsen Bay is located on the north side of Kodiak Island on Larsen Bay. Its protected site provides excellent access to the fisheries of Shelikof Strait and Larsen Bay which has made it an attractive spot for a cannery. The number of fishermen in Larsen Bay generally increased from 1975 to 1982 but fell off precipitously in 1982, apparently from the overall decline in the fisheries (Table 49). The number of confidential fisherman in Larsen Bay has remained fairly constant as a proportion of the total fishermen over the 1975 to 1983 period. This would appear to indicate that there is a group of fishermen who have pursued crab over the entire period.

Individual gross earnings of Larsen Bay fishermen have fluctuated widely over the period (Table 50). After remaining fairly steady at between $10-15,000 from 1975 to 1979, they jumped to around $24,000 in 1980 and 1981. They then dropped sharply to $3,200 in 1982 and climbed only to $6,800 in 1983. Of the four villages which have maintained a measurable presence in the commercial fisheries over the study period, Larsen Bay has the lowest average gross earnings. With several exceptions, total earnings of Larsen Bay fishermen (individual and confidential) generally parallel the findings from individual fishermen (Table 52). There were substantially higher confidential earnings in 1978, 1979 and 1981, the peak earning years for these Larsen Bay fishermen. Total gross earnings of Larsen Bay have accounted for less than 1 percent of all Kodiak community commercial fishing earnings over the study period.

Confidential earnings appeared for Larsen Bay fishermen first in 1977 and from 1978-1981 provided about an additional 33 percent over individually reported earnings. In 1982 and 1983, however, confidential earnings were three to five times greater than individually reported earnings. This suggests that the casualties in the decline of the number of Larsen Bay fishermen are traditional fishermen pursuing primarily salmon and occasionally halibut. This suggestion is also supported by other CFEC data that indicate purse seine is now the dominant salmon gear used by Larsen Bay fishermen whereas in the mid-1970s there were also a sizable number of set gillnet and beach seine fishermen. Those that remain appear to be ones who have diversified and perhaps have larger vessels for that purpose.

As with the other villages, salmon were the mainstay of the commercial fisheries during the study period, never falling below 85 percent of total earnings (Table 56). The only other species for which either individual or confidential earnings are reported is halibut. Halibut have been consistently harvested since 1978 and in 1982 and 1983 played an increasing but still minor role in the earnings of the Larsen Bay fishermen. Although Table 51 indicates involvement in the crab fisheries since 1979, the numbers have stayed very small--only reaching three fishermen taking crab in 1983. Despite the existence of crab fishermen, CFEC confidentiality standards prevented the report of their earnings. There is no participation to speak of in the herring fisheries.

All of Larsen Bay fishermen's earnings are taken from the Kodiak management area. More traditional fishermen tend to stay on the northside of the island while the diversified fishermen travel to other areas of the archipelago. There is no additional information on costs and net earnings for Larsen Bay beyond that presented in the regional summary.

Despite the existence in the community of a cannery, now owned by Larsen Bay Seafoods, Inc., a subsidiary of Universal Seafoods, Inc., Larsen Bay has not benefited from the advantage of this facility. Although Universal Seafoods has a number of Seattle and Kodiak fishermen as stockholders, no Larsen Bay fishermen is a co-owner. The remaining fishermen do store their vessels and equipment at the cannery but make arrangements individually to sell their products to different firms.

The more aggressive and entrepreneurial fishermen who remain in Larsen Bay tend not to use kin for crewmen. The few traditional fishermen who remain use crews composed of a mix of kinsmen and capable outsiders. Because the cannery stores vessels for a large number of non-local fishermen which in turn attracts some transient crewmen to the community, Larsen Bay resident fishermen may have better access to non-local labor than do other Kodiak villages.

Old Harbor

The community of Old Harbor is located in the southwestern portion of Kodiak Island and is well situated for participation in crab, halibut, and groundfish fisheries (Fig. 1).

The number of fishermen in Old Harbor increased 30 percent, from 31 to 41, during the study period (Table 49). Other than 1980, when there were five confidential fishermen, there were only two confidential fishermen at most in other years. This implies no radically individualistic diversification into fisheries during the period.

Average gross earnings of individually reported Old Harbor fishermen are presented in Table 50. Although well below Kodiak city fishermen's average earnings, Old Harbor fishermen have had the highest average earnings of rural Kodiak fishermen in every year of the study period except 1975 and 1982. The maximum average earnings were achieved in 1981 at $83,400 and the minimum in 1975 at $11,200. The total earnings of Old Harbor fishermen (individual and confidential) are presented in Table 52. Old Harbor fishermen have accounted for more than 50 percent of rural Kodiak commercial fishing gross earnings in two years and normally account for between 40 and 50 percent of all rural earnings. Old Harbor totals generally account for 2-3 percent of all Kodiak community commercial fishing earnings.

Confidential earnings first appear for Old Harbor fishermen in 1979 and are highest the same year when they amount to over $600,000 or about 42 percent of individually reported earnings. This indicates a highly skewed distribution of income in Old Harbor with a few highline fishermen benefitting from diversification into new fisheries.

Salmon have been the major contributors to the earnings of Old Harbor fishermen as indicated in Table 56. Pink and chum salmon are far and away the most important with red salmon being a minor contributor to earnings.

This is the result of location and gear type. Old Harbor does not have a major red salmon producing system nearby, so fishermen overwhelmingly use purse seine gear that targets on pink and chum salmon because of their abundance. Table 56 also indicates, however, a substantial shift in 1982 and 1983 when tanner crab and sac roe herring assumed far greater proportions of total value. Salmon provided only a slim majority of 56.6 percent of total commercial fisheries value in 1983.

Old Harbor fishermen are different from Akhiok and Karluk fishermen in that they have actively pursued the crab fisheries. Table 56 summarizes individual and confidential earnings of the three rural communities where fishermen have consistently been involved in the crab fishery. Table 57, providing further breakout on the number of individual reported crab fishermen, indicates that six to eight of them have pursued one or both of the major crab species since 1979. Although average earnings have been below rural and Kodiak city averages, continued involvement would appear to indicate that a reasonable rate of return is being obtained. In the king crab fishery, the highest average was earned in 1981. An average earning figure for tanner crab is available only for 1983; however confidential earnings show that tanners produced substantially greater gross earnings to the community in 1979, 1980, and 1982 than it did in 1983.

The confidential fisheries pursued by Old Harbor fishermen are presented in Table 51. It is apparent they have been active in the crab fisheries with large vessels since at least 1976. The large boats also began minor pursuit of tanner crab in 1979 and shifted to tanners in 1983 when king crab were closed. Halibut were taken consistently by two vessels over the time period. Sac roe herring were actively pursued by purse seiners from 1979 to 1981 and provided a significant amount of income in each of those years. All of the Old Harbor earnings are taken in the Kodiak management area. Salmon fishermen concentrate their efforts in familiar waters near the community. Crab fishermen also tend to fish waters off the southwestern end of Kodiak Island. For sac roe herring, they travel throughout the Kodiak archipelago. There is no additional information on costs and net earnings for Old Harbor fishermen beyond that presented in the regional summary.

Old Harbor fishermen have primary linkages to the CWF cannery at Lazy Bay where a number of them store their vessels. A significant portion of them are now independent vessel owners who deliver their catches to the highest bidder. State loans have been used to purchase new vessels. More traditional fishermen who lease vessels from the cannery and fish only for salmon tend to use the domestic mode of production. The highline fishermen utilize kinsmen and nonlocal crewmen in approximately equal proportions, especially for crab fishing.

Ouzinkie

Located fifteen miles to the northwest of Kodiak city, Ouzinkie is well situated with regard to the productive Marmot Flats area for halibut and

TABLE 57

INDIVIDUAL AND CONFIDENTIAL KING AND TANNER CRAB GROSS EARNINGS BY KODIAK VILLAGE FISHERMEN, 1975-1983

(Thousands of Dollars)

Year

Community[1]	1975		1976		1977		1978		1979		1980		1981		1982		1983	
Vessel Size Species	n	Mean	n	Mean	n	Mean	n	Mean	n	Mean	n	Mean	n	Mean	n	Mean	n	Mean
Old Harbor																		
50' or less																		
King Crab	4	$13.8	—	—	—	—	—	—	4	$19.3	—	—	4	$21.9	5	$15.6	—	—
50' or less																		
Tanner Crab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5	$17.9
Confidential	—		—		—		—		$234.8		$105.6		$0.0		$162.7		—	
Ouzinkie																		
50' or less																		
King Crab	—	—	5	$21.2	—	—	—	—	4	$13.4	—	—	—	—	4	$15.4	—	—
Confidential	—		—		—		$102.1		—		$242.6		$527.1		—		—	
50' or less																		
Tanner Crab	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5	$16.7
Confidential	—		—		—		—		$192.8		$125.1		$127.7		$279.4		$148.1	
Port Lions																		
50' or less																		
King Crab	10	$9.1	10	$20.6	10	$14.9	9	$7.9	9	$5.9	13	$25.1	8	$26.5	12	$34.0	—	—
Confidential	—		—		—		$761.0		$599.5		—		$740.5		$436.2		—	
50' or less																		
Tanner Crab	4	$1.8	6	$12.7	11	$30.8	5	$18.2	8	$19.9	10	$8.9	5	$9.5	9	$30.8	10	$9.7
Confidential	—		—		—		$313.3		$175.3		$171.9		$122.5		$296.2		$162.5	

TABLE 57 (continued)

INDIVIDUAL AND CONFIDENTIAL KING AND TANNER CRAB GROSS EARNINGS BY KODIAK VILLAGE FISHERMEN, 1975-1983

(Thousands of Dollars)

Community[1] Vessel Size Species	1975		1976		1977		1978		1979		1980		1981		1982		1983	
	n	Mean	n	Mean	n	Mean	n	Mean	n	Mean	n	Mean	n	Mean	n	Mean	n	Mean
Rural Total (Individually reported only)																		
50' or less																		
King Crab	14	$10.4	15	$20.8	10	$14.9	9	$7.9	17	$10.8	13	$25.1	12	$25.0	21	$26.1	—	—
Tanner Crab	4	$1.8	6	$12.7	11	$30.8	5	$18.2	8	$19.9	10	$8.9	5	$9.5	9	$30.8	20	$11.0
Rural Total (Confidential only)																		
King Crab		—		—		—		$863.1		$599.5		$242.6		$1267.6		$436.2		—
Tanner Crab		—		—		—		$313.3		$602.9		$402.6		$250.2		$738.3		$310.6

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1 Confidential earnings may be for large or small vessels.

SOURCE: CFEC

crab (Fig. 1). The proximity to Kodiak also places fishermen from Ouzinkie in greater competition with small boat Kodiak city fishermen than are the other villagers on the island.

The number of Ouzinkie fishermen increased during the study period from 18 to 26 in 1982 and then dropped to 23 in 1983. However, the diversity of scale and species declined over the period. Table 51 indicates that from 1975 to 1978 there were Ouzinkie fishermen who took shrimp both with trawl and pots. By 1978 these activities had disappeared. The number of confidential fishermen fluctuated throughout the study period indicating sporadic attempts at different fisheries. Average gross earnings are presented in Table 50. During the first six years of the study period, Ouzinkie was generally intermediate between Old Harbor (high) and Port Lions (low)--the three villages displaying a diversified commercial fisheries orientation. From 1981 to 1983, however, Ouzinkie had the lowest average gross earnings of any village except Larsen Bay. Ouzinkie's peak average gross was attained in 1976 when 15 fishermen averaged $40,900; in 1975, 1982 and 1983 average gross earnings were below $17,000.

The total confidential and individual gross earnings for Ouzinkie are found in Table 52. Substantial amounts of confidential earnings occur from 1978 on, with confidential earnings in 1981 amounting to more than twice reported individual earnings. The relative proportion of confidential earnings to reported individual earnings is indicative of a small number of very productive fishermen and a larger number of not so productive fishermen. Total gross earnings of Ouzinkie fishermen increased from a low of 14.1 percent of the rural total and .8 percent of the regional total in 1975 to a high of 27.2 percent of the rural total and 1.9 percent of the regional total in 1981. Since 1981, Ouzinkie's share dropped back to 17.2 percent in 1983.

Ouzinkie fishermen are similar to other rural Kodiak fishermen in that salmon has been the primary contributor to their commercial fisheries earnings. Table 56 also indicates, however, that salmon were supplemented by a substantial amount of crab earnings after 1980, when tanner and king crab combined for nearly 30 percent of the earnings. Of the Kodiak villages, Ouzinkie has also exhibited the second most consistent pattern of participation in the halibut fisheries, ranging from 4 fishermen in 1977 to 21 in 1981. Village fishermen have a consistent record of participation in the crab fisheries (Tables 51, 56, and 57). Table 51 indicates that the confidential fishermen who have taken king and tanner crab over the years have operated larger vessels. Table 57 indicates, on the other hand, that reported individual earnings from crab were taken from smaller vessels, and that relatively few villages have been involved in the crab fisheries. Table 57 also indicates that Ouzinkie's confidential crab fishermen have done very well over the years. In addition to crab and halibut, Ouzinkie fishermen have been involved in the sac roe herring fishery with both purse seines and gillnets. With the exception of the large boats when pursuing halibut, all commercial fishing earnings were obtained from the Kodiak management area.

The relationship of Ouzinkie fishermen to processors is varied. There are a small number of salmon-only fishermen who retain strong ties with processors through vessel leases and provision of winter credit. There are also a number of independent small vessel owners, both salmon and non-salmon, who pursue a variety of different markets. Finally, there are three successful highline fishermen who have been able to purchase large vessels with state loans. The basic pattern of production involves using family members and other kinsmen as crew. There are a number of small skiff operators who pursue halibut with kinsmen and this is prevalent among the salmon only fleet as well. Larger vessels use a combination of kin, other local residents and nonlocals for crew.

Port Lions

Since its establishment in 1965 following the Great Alaska Earthquake of 1964, Port Lions has been actively involved in the crab fisheries of Shelikof Strait. The community is fortunate to have a good anchorage and a state-financed small boat harbor with a breakwater. A crab cannery operated in the community until it burned down in 1976; residents still hope a processing facility will return in the future. The community has strong historical ties to the salmon fishery and has the longest and most extensive involvement in the crab fisheries of any Kodiak rural community.

Over the study period, the number of commercial fishermen in Port Lions grew from 17 to a peak of 32 in 1980. The number dropped sharply, and inexplicably, from 30 in 1981 to 20 in 1983. The number of confidential fishermen was highest in the period from 1979-1981 but has gone down since then. Average gross earnings appear in Table 50. The high for individually reported fishermen occurred in 1975 at $37,000 dollars. The low was realized in 1983 at $17,600.

Table 52 indicates that Port Lions had sizable confidential earnings after 1978, in five years amounting to more than twice the individually reported earnings. Peak total gross earnings were attained in 1981 when nearly $1.8 million were taken in. The lowest total was in 1975 at $592,700. The share of rural earnings has fluctuated from a high of 52.2 percent in 1975 to a low of 20.4 percent the next year. In most years the community accounted for 25-40 percent of rural gross earnings; its share of regional gross earnings ranged from a low of 1.3 to a high of 2.9 percent. The pattern for Port Lions fishermen reflected in Table 56 marks them as distinctive from all other village fishermen because salmon did not produce the majority of earnings. Indeed, in only two years (1976 and 1977) did salmon provide more than 50 percent of the total earnings. Port Lions is also distinctive in that it is king crab that was the primary other fishery up to 1983. Sac roe herring and tanner crab became important in the final two years of the study period. More than any other rural villagers, Port Lions fishermen have shown a steady pattern of participation in the halibut fishery despite its low earnings. The number of participants ranged from 7 in 1979 to 17 in 1980.

Throughout the study period larger vessels rigged for crabbing were part of the Port Lions fleet. They were the only Kodiak village vessels that went to the Bering Sea to fish king crab. This happened in 1976, 1977 and again in 1983. Tanner crab were also caught by Port Lions' fishermen from larger vessels but not from smaller ones. Finally, they were the only rural fishermen to harvest dungeness crab. Crab earnings are presented in Table 57. More than any other rural ones, Port Lions fishermen are dependent upon crab, which accounted for at least one-third of the commercial fishing earnings in each year of the study period. From 1979 to 1982, crab earnings accounted for over 50 percent in all but one year and over two-thirds in several years. The larger vessels included under confidential earnings averaged substantially higher earnings than the individually reported small boat fishermen. This is evidence of a marked degree of stratification between Port Lions fishermen who use large vessels and those who use smaller ones.

In addition to salmon and crab, the fishermen have been involved in a very limited way in sac roe herring, halibut, and shrimp fisheries.

Port Lions fishermen have had a long-term relationship with the Columbia Wards facility at Port Bailey. In the early days of this arrangement the fishermen would lease vessels from Port Bailey; a small number of fishermen continue to do so. Other fishermen have become independent vessel owners by using state loans. The crab facility offered a variety of services to crabbers before it burned; however, since that loss it has been more difficult to maintain larger vessels in Port Lions. Probably more than any other rural fishermen Port Lions operators follow the Kodiak city pattern of using the best skilled crewmen that can be obtained whether they are kinsmen, other local residents, or nonlocal nonrelatives. This is particularly true of the fishermen who use larger vessels. Many small boat fishermen continue to use kinsmen and local residents, especially in the salmon fisheries.

Summary

In the Kodiak region, there are three patterns of community participation in commercial fisheries. Kodiak city demonstrates one pattern; it is the dominant center of commercial fisheries as home to a large diversified fleet and a large complex processing sector. Within the community are several different kinds of fishermen ranging from small boat halibut fishermen, to pocket seine salmon and crab operators, to limited seine salmon, crab and sac roe herring fishermen, to larger Bering Sea crab, as well as shrimp and groundfish harvesters. For our study period, the most important species to Kodiak city fishermen were crab, with king crab being the most important up until 1983. Salmon were a secondary species group. Rapid growth of the number of fishermen and their average gross earnings characterized the period from 1975 to 1981. However, since 1981 the number of fishermen and their average gross earnings declined, quite sharply in 1983. An important trend was the growth of diversification in the fisheries, especially in the period after the 1983 collapse of the king crab stocks. New fisheries that emerged included sac roe herring (both purse seine and gillnet), groundfish joint ventures, dungeness crab, and sablefish. Halibut, a longstanding historical fishery, assumed great importance in the final three years of the study period. The abundance of halibut and the need for alternatives to king crab contributed to this importance.

The second pattern is the rural community with a substantial involvement in commercial fisheries. Old Harbor, Port Lions, and Ouzinkie can be placed together in this grouping. In each there is a mix of traditional and contemporary fishermen, the latter having diversified at least to some degree in recent times. Crab, sac roe herring, and halibut are the most important alternative fisheries. Of the communities, Port Lions appears to be the most similar to Kodiak city in the size of vessels, the fisheries pursued, and the proportion of total earnings derived from different species. Crab were more important to Port Lions fishermen than salmon whereas for all other rural communities, salmon was the producer of the majority of value. Despite diversification, these communities lack large vessel experience in shrimp and groundfish, the dragging (trawling) fisheries now growing in prominence with the emergence of Shelikof Strait pollock joint ventures.

The third community pattern is one of declining involvement in commercial fisheries. It is exhibited by Larsen Bay, Akhiok, and Karluk. At the start of the study period these villages were primarily traditional salmon oriented communities. For a variety of reasons, including poor local harbors, lack of vessel and gear storage facilities, disasters, and poverty, the fishermen in these communities have sold most of their permits, particularly set gillnet permits. Although commercial fishing is still important to residents of Larsen Bay, participation declined over the study period as those who could not or would not diversify left the fishery. By the end of the study period, residents of Akhiok and Karluk appeared to be only minimally involved in commercial fisheries.

CHIGNIK

The communities of the Chignik region include Chignik proper, also referred to as Chignik Bay; Chignik Lagoon, Chignik Lake, Perryville, and Ivanof Bay. Commercial fisheries, particularly the red salmon of Chignik River and Lake, are the fundamental fishery and the economic foundation of the region.

Characteristics of Chignik fishermen are presented in Tables 58-61. The number of persons (reported and confidential) with commercial fishing earnings will be found in Table 58. Table 59 indicates the average earnings of reported individuals from CFEC records for 1975 to 1983 as well as total nonconfidential earnings for each village. Table 60 indicates the fisheries pursued by confidential fishermen from the communities, and Table 61 reports the gross earnings by species of confidential fishermen. The combination of reported and confidential gross earnings should give a close

TABLE 58

CHIGNIK AREA FISHERMEN BY COMMUNITY
1975 - 1983

COMMUNITY	YEAR								
	1975	1976	1977	1978	1979	1980	1981	1982	1983
Chignik									
Identified	6	7	8	8	9	11	10	11	16
Confidential	0	0	0	2	3	2	0	4	1
Subtotal	6	7	8	10	12	13	10	15	17
Chignik Lagoon									
Identified	9	13	13	8	9	11	12	13	15
Confidential	0	0	0	0	3	3	2	2	1
Subtotal	9	13	13	8	12	14	14	15	16
Chignik Lake									
Identified	4	4	5	7	7	10	7	10	9
Confidential	0	0	0	2	2	3	3	3	2
Subtotal	4	4	5	9	9	13	10	13	11
Ivanof Bay									
Identified	0	0	0	0	0	0	0	0	0
Confidential	0	0	0	0	1	1	2	2	2
Subtotal	0	0	0	0	1	1	2	2	2
Perryville									
Identified	8	6	7	7	5	6	8	6	7
Confidential	0	0	0	1	2	1	2	2	0
Subtotal	8	6	7	8	7	7	10	8	7
Total									
Identified	27	30	33	30	30	38	37	40	47
Confidential	0	0	0	5	11	10	9	13	6
All	27	30	33	35	41	48	46	53	53
(%)	(31.4%)	(45.4%)	(37.5%)	(36.8%)	(40.6%)	(47.5%)	(44.7%)	(50.5%)	(53%)

SOURCE: CFEC

TABLE 59
CHIGNIK AREA FISHERMEN TOTAL AVERAGE GROSS EARNINGS BY COMMUNITY, 1975-1983

(Thousands of Dollars)

COMMUNITY	YEAR								
	1975	1976	1977	1978	1979	1980	1981	1982	1983
Chignik									
No. Fish	6	7	8	8	9	11	10	11	16
% of Region	(22.2%)	(23.3%)	(24.2%)	(26.7%)	(30%)	(28.9%)	(27%)	(27.5%)	(34%)
Average Gross	$ 19.0	$ 54.9	$ 155.0	$ 106.8	$ 97.2	$ 56.9	$ 151.4	$ 106.6	$ 86.0
Total Village	$ 114.2	$ 384.1	$1239.7	$ 854.1	$ 874.6	$ 625.4	$1574.0	$1172.6	$1375.9
% of Region	(18%)	(19.3%)	(22.2%)	(18.9%)	(22.4%)	(15.6%)	(24.4%)	(21.3%)	(28.1%)
Chignik Lagoon									
No. Fish	9	13	13	8	9	11	12	13	15
% of Region	(33.3%)	(43.3%)	(39.4%)	(26.7%)	(30%)	(28.9%)	(32.4%)	(32.5%)	(31.9%)
Average Gross	$ 31.3	$ 75.7	$ 187.9	$ 159.0	$ 153.7	$ 78.1	$ 219.7	$ 195.9	$ 122.2
Total Village	$ 281.6	$ 983.8	$2442.2	$1271.7	$1383.6	$ 856.6	$2636.7	$2546.3	$1832.5
% of Region	(44.3%)	(49.4%)	(43.8%)	(28.1%)	(35.5%)	(35.2%)	(90.8%)	(46.3%)	(37.4%)
Chignik Lake									
No. Fish	4	4	5	7	7	10	7	10	9
% of Region	(14.8%)	(13.3%)	(15.1%)	(23.3%)	(23.3%)	(26.3%)	(18.9%)	(25%)	(19.1%)
Average Gross	$ 20.6	$ 62.4	$ 141.5	$ 145.6	$ 115.1	$ 51.4	$ 133.1	$ 99.1	$ 85.2
Total Village	$ 82.4	$ 249.6	$ 707.3	$1019.0	$ 805.9	$ 514.4	$ 931.8	$ 990.5	$ 766.5
% of Region	(13%)	(12.5%)	(12.7%)	(22.5%)	(20.2%)	(21.1%)	(14.4%)	(18.0%)	(15.6%)
Ivanof Bay - No individually reported fishermen.									
Perryville									
No. Fish	8	6	7	7	5	6	8	6	7
% of Region	(29.6%)	(20%)	(21.2%)	(23.3%)	(16.7%)	(15.8%)	(21.6%)	(15%)	(14.9%)
Average Gross	$ 19.7	$ 62.4	$ 169.2	$ 197.8	$ 166.7	$ 73.9	$ 164.8	$ 131.9	$ 131.8
Total Village	$ 159.7	$ 374.3	$1184.2	$1384.9	$ 833.5	$ 443.5	$1318.6	$ 791.2	$ 922.6
% of Region	(24.8%)	(18.8%)	(21.2%)	(30.6%)	(21.4%)	(18.2%)	(20.4%)	(14.4%)	(18.8%)
Total									
No. Fish	27	30	33	30	30	38	37	40	47
Average Gross	$ 23.6	$ 66.4	$ 168.9	$ 151.0	$ 129.9	$ 64.3	$ 174.6	$ 137.5	$ 104.2
Total Area	$ 635.9	$1991.8	$5573.4	$4529.7	$3897.6	$2441.9	$6461.1	$5500.6	$4897.5

Cultural Dynamics 1986

SOURCE: CFEC

TABLE 60
CONFIDENTIAL CHIGNIK AREA FISHERMEN BY COMMUNITY, SPECIES, GEAR TYPE, AND VESSEL SIZE, 1975-1983

Community/ Species/ Gear Type/ Vessel Size	YEAR								
	1975	1976	1977	1978	1979	1980	1981	1982	1983
Chignik									
Salmon									
Purse Seine	0	0	0	2	3	2	0	4	1
Halibut	0	0	0	0	1	1	0	0	0
King Crab									
<50'	0	1	1	1	2	2	1	1	0
>50'	1	0	0	0	0	0	1	1	1
Tanner Crab									
<50'	0	1	1	2	2	1	2	0	1
>50'	0	0	0	0	0	1	1	0	1
Dungeness Crab									
<50'	0	0	0	0	0	0	0	0	0
>50'	0	0	0	0	0	0	0	1	1
Herring (sac roe)									
Purse Seine	0	0	0	0	0	0	2	1	0
Chignik Lagoon									
Salmon	0	0	0	0	3	3	2	2	1
Purse Seine							1(SO3E)	1(SO3E)*	
Halibut	0	0	0	2	2	2	0	0	0
King Crab									
<50'	0	2	0	1	1	0	0	0	0
Fished, Dutch Harbor and Bering Sea									
>50'	0	0	0	0	0	2	0	1	0
Tanner Crab									
<50'	0	0	0	0	1	0	1	1	2
>50'	0	0	0	0	0	1	1	1	1
Herring (sac roe)									
Purse seine	0	0	0	0	2	2	0	0	0
Dungeness Crab									
<50'	0	0	0	0	0	0	0	0	0
>50'	0	0	0	0	0	0	0	0	1

* Prince William Sound
drift gill net

Continued next page

TABLE 60 (Continued)
CONFIDENTIAL CHIGNIK AREA FISHERMEN BY COMMUNITY, SPECIES, GEAR TYPE, AND VESSEL SIZE, 1975-1983

	YEAR								
Community/ Species/ Gear Type/ Vessel Size	1975	1976	1977	1978	1979	1980	1981	1982	1983
Chignik Lake									
Salmon									
Purse Seine	0	0	0	2	2	3	3	3	2
Halibut	0	0	0	0	1	0	0	1	0
Herring (sac roe)									
Purse Seine	0	0	0	0	0	0	0	1	2
Ivanof Bay									
Salmon									
Purse seine	0	0	0	0	1	1	2	2	2
Gillnet	1	0	0	0	0	0	0	0	0
Halibut	0	0	0	0	0	0	0	2	0
Perryville									
Salmon									
Purse seine	0	0	0	1	2	1	2	2	0
Halibut	0	0	0	0	0	0	0	3	0
Herring (sac roe)									
Purse seine	0	0	0	0	0	0	2	0	0

Cultural Dynamics 1986

SOURCE: CFEC

TABLE 61

CONFIDENTIAL EARNINGS OF CHIGNIK AREA FISHERMEN BY COMMUNITY AND SPECIES, 1975-1983

(Thousands of Dollars)

Community/ Species	Year								
	1975	1976	1977	1978	1979	1980	1981	1982	1983
Chignik									
Salmon	0	0	0	0	503.4	47.4	800.1	168.5	18.0
Herring sac roe	0	0	0	0	0	0	0	0	263.9
Tanner crab	0	0	0	0	0	0	0	154.2	157.7
Total	0	0	0	0	503.4	47.4	800.1	322.7	439.6
Chignik Lagoon									
Salmon	0	0	0	1279.0	0	165.7	146.6	277.4	0
Halibut	0	0	0	0	0	0	0	3.7	0
Herring sac roe	0	0	0	0	0	0	92.3	101.7	183.1
Total	0	0	0	1279.0	0	165.7	238.9	382.8	183.1

SOURCE: CFEC

Cultural Dynamics 1986

approximation of the commercial fisheries earnings realized by members of a given community; however there are additional earnings which CFEC could not reveal because of confidentiality considerations.

Chignik Bay

Chignik Bay is the focal point of the region in terms of contacts with the world outside the area. Two of the region's three processors are located at Chignik and, as an incorporated community, it is the beneficiary of raw fish tax monies. Table 58 indicates that the number of commercial fishermen has grown from six in 1975 to 17 in 1982. This rapid growth is a function of the wealth of the salmon fisheries and increasing use of permits. The increasing number of confidential fishermen beginning in 1978 indicates the onset of diversification into other fisheries.

The fisheries pursued by confidential fishermen is revealed in Table 60. Sac Roe herring and halibut have been minor species. Halibut were harvested only in 1979 and 1980 by one vessel each year while herring were caught by two fishermen in 1981 and one in 1982. Of the shellfish, king crab has the longest history, dating to 1975 when they were taken by a large vessel in the Bering Sea. From 1977 to the end of the study period at least one, and in 1979 and 1980 two, fishermen harvested king crab from smaller, Chignik seine class vessels. Beginning in 1981 and continuing through 1983, a large vessel with a Chignik resident again harvested king crab. Tanner crab began being harvested in 1976 and were taken by one or two vessels in all years after that time except 1982. In 1980, 1981 and 1983 a large vessel also harvested tanner crab. Dungeness crab have only been taken quite recently by Chignik fishermen; they used large vessels beginning in 1982. The larger vessels that enter the picture in 1981 appear to have been second vessels purchased by several of the more successful fishermen using their exceptional earnings from the previous four years. It should be noted that no shrimp, groundfish, or scallops have been harvested by Chignik village fishermen.

Average total gross earnings for these fishermen appear in Table 59. The figures grew from a low of $19,000 in 1975 to a high of $157,400 in 1981. As the permit values indicate, earnings from the Chignik purse seine fishery are exceptional among Alaskan salmon fisheries. Based on individually reported earnings only, Chignik is generally third highest in average gross earnings among the four communities for which data is available.

The species composition are presented in Table 62. Red salmon are undoubtedly the most important, since they comprised over 75 percent in six of the nine study years and never fell under 59 percent. Pink, chum, and coho, in descending order of importance, exhibit relatively similar contribution profiles; generally they combined to provide about 25 percent of the average earnings. Pink salmon in 1979 were the only species other than red salmon to provide more than 25 percent of total value in any year.

TABLE 62

TOTAL GROSS EARNINGS OF CHIGNIK (COMMUNITY) FISHERMEN[1] BY SPECIES, 1975-1983

(thousands of dollars)

Species	1975	1976	1977	1978	1979	1980	1981	1982	1983
Red									
No. Fishermen	6	7	8	8	9	11	10	10	16
Earnings	67.6	342.2	1012.5	781.6	579.2	435.0	1364.0	895.9	1271.6
% Of Total	59.2%	89.1%	81.7%	91.5%	66.2%	69.6%	86.7%	76.4%	92.4%
Pink									
No. Fishermen	6	7	8	7	9	11	10	10	16
Earnings	15.1	21.7	103.5	25.0	234.5	98.1	52.5	38.6	35.5
% Of Total	13.2%	5.6%	8.3%	2.9%	26.8%	15.7%	3.3%	3.3%	2.6%
Chum									
No. Fishermen	6	7	8	7	9	9	10	10	15
Earnings	7.3	9.8	113.1	40.8	42.4	73.5	136.3	110.3	4.3
% Of Total	6.4%	2.5%	9.1%	4.8%	4.8%	11.7%	8.7%	9.4%	.3%
Coho									
No. Fishermen	6	6	7	5	9	10	10	10	15
Earnings	23.8	9.8	10.1	4.7	16.8	16.5	18.2	125.6	23.0
% Of Total	20.8%	2.5%	.8%	.5%	1.9%	2.6%	1.2%	10.7%	1.7%
King									
No. Fishermen	5	5	4	6	7	9	10	8	14
Earnings	.3	.6	.5	2.0	1.6	2.3	3.0	2.3	6.5
% Of Total	.3%	2.5%	—	.2%	.2%	.4%	.2%	.2%	.5%
Totals									
No. Fishermen	6	7	8	8	9	11	10	11	16
Earnings	114.2	384.1	1239.7	854.1	874.6	625.4	1574.0	1172.6	1375.9

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[1] Individually reported earnings only.

SOURCE: CFEC

Confidential earnings for Chignik fishermen from salmon, sac roe herring, and tanner crab begin in 1979 (Table 61). At their best in 1983, tanner crab and sac roe herring combined to add an additional 33 percent to the earnings. Most substantial in 1979, 1981, 1982, and 1983 confidential earnings ranged from 30 percent to over 50 percent of reported individual earnings. This indicates that a very few fishermen have incomes substantially above those of other fishermen as a result of their participation in these alternative fisheries.

All fisheries earnings, reported and confidential, of Chignik fishermen were taken from the Chignik management area. No additional information on costs and net earnings for Chignik vessels are available beyond the picture presented in the earlier section on the regional harvesting sector. The combination of limited entry in 1975 and sharply increased earnings beginning in 1976 combined to bring about a radical restructuring of relationships between processors and fishermen (see the previous harvesting sector discussion). Fishermen now negotiate with processors on an annual basis. No information on vessel loans to Chignik community fishermen is available.

Crewmen are a combination of kinsmen, local residents and nonlocal persons, both relatives and nonrelatives. The employment of nonlocal crewmen by Chignik fishermen most likely comes from the community's role as regional center. Crewshares have generally declined in the past few years. During the 1970s, a crewman usually received 20 percent of the gross earnings, but now 12-15 percent is the norm. This has caused resentment and tension, especially among older crewmen who were accustomed to receiving 20 percent. It is not clear what caused the decline in crewshare; however, new vessel purchases and increased availability of nonlocal labor may be partially responsible.

Chignik Lagoon

Chignik Lagoon is the site of intense activity during the salmon fishing season. The largest part of the red salmon harvest occurs in the lagoon proper on its north and south shores. The community is located nearby. At high tide most of the regions's 90+ pocket (35-45 foot) seiners flood into the small tidally drained shallow basin. The furor and frenzy of men pursuing fish is overwhelming but it is almost always conducted in good humor. Chignik area fishermen are noted for their ability to fish peaceably with each other no matter what the circumstance.

The number of fishermen residing in Chignik Lagoon from 1975 to 1983 is presented in Table 58. Including confidential fishermen, the number has increased from nine in 1975 to 16 in 1983. In all study years Chignik Lagoon had more fishermen than any other Chignik region community. The fishermen have consistently had the highest average gross, leading in six of the nine study years. The lowest average gross occurred in 1975 at $31,300 with the peak of $219,700 realized in 1981 (Table 59).

Red salmon were the most important species harvested by Chignik Lagoon fishermen in terms of earnings (Table 63). During the nine-year study

TABLE 63

TOTAL GROSS EARNINGS OF CHIGNIK LAGOON FISHERMEN BY SPECIES, 1975-1983

					Year				
Species	**1975**	**1976**	**1977**	**1978**	**1979**	**1980**	**1981**	**1982**	**1983**
Red									
# Of Fishermen	9	13	13	8	9	10	12	13	15
Earnings	224.4	873.5	2312.9	1171.3	1080.6	571.4	2116.8	2087.8	1740.8
% Of Total	79.7%	88.8%	95.1%	92.1%	78.1%	66.5%	80.3%	82%	95.0%
Pink									
# Of Fishermen	9	13	13	7	9	11	12	13	14
Earnings	4.5	40.6	56.9	56.8	123.2	156.0	120.4	44.6	11.6
% Of Total	1.6%	4.1%	2.3%	4.5%	8.9%	18.2%	4.6%	1.7%	.6%
Chum									
# Of Fishermen	9	13	11	6	9	11	12	13	14
Earnings	4.0	20.0	24.8	19.6	39.4	68.3	308.8	105.8	35.2
% Of Total	1.4%	2.0%	1.0%	1.5%	2.8%	7.9%	11.7%	4.2%	1.8%
Coho									
# Of Fishermen	9	12	12	6	9	10	12	13	13
Earnings	45.0	44.3	35.3	18.4	101.8	56.7	79.8	299.0	27.3
% Of Total	16.0%	4.5%	1.4%	1.4%	7.4%	6.6%	3.0%	11.7%	1.5%
King									
# Of Fishermen	6	9	10	8	9	9	12	13	15
Earnings	1.3	5.5	3.3	5.6	2.1	6.1	10.8	2.3	17.6
% Of Total	.5%	.6%	.1%	.4%	.1%	.7%	.4%	.1%	1.0%
Halibut									
# Of Fishermen	---	---	5	---	4	---	---	---	---
Earnings	---	---	9.1	---	36.6	---	---	---	---
% Of Total	---	---	.4%	---	2.6%	---	---	---	---
Totals									
# Of Fishermen	9	13	13	8	9	11	12	13	15
Earnings	281.6	983.8	2433.1	1271.7	1383.6	858.6	2636.7	2546.3	1832.5

Cultural Dynamics

SOURCE: CFEC

period, red salmon never fell below 66.5 percent of all earn-ings. Pink, coho, and chum, in that order of importance, generally combined to provide about 20 percent of the fishermen's income. Halibut made an incidental contribution in 1977 and in 1979.

The fisheries pursued by confidential Chignik Lagoon fishermen are noted in Table 60. The data reveal that these fishermen are the most diversified of any in the area. Several confidential salmon fishermen appear in 1979 with one Prince William Sound purse seine fishermen in 1981 and 1982. Halibut was harvested from 1977 to 1980. King crab in vessels under 50 feet in length were harvested in 1976 and again in 1978 and 1979 while tanner crab were taken by the smaller vessels in 1979 and then from 1981 to 1983 with an increase to two vessels in 1983 from one in previous years.

Dungeness crab were taken only in 1983 by one large vessel. Chignik Lagoon fishermen pursued sac roe herring only in 1979 and 1980. One large vessel appears in the Chignik Lagoon data in 1980 and apparently has fished tanner crab each year since that time. It is likely that, as in Chignik, one or two Chignik Lagoon fishermen purchased an additional large vessel for crab fishing following several years of high earnings in the salmon fishery. One additional noteworthy characteristic of the confidential fisheries data is that two vessels in 1980 and one in 1982 fished for king crab in Dutch Harbor and the Bering Sea, the only instances of this occurring in any Chignik area community.

The earnings from certain confidential fisheries pursued by Chignik Lagoon fishermen are exhibited in Table 61. These data indicate a sizable increment in salmon earnings in 1978 but much lower additions in subsequent years. Note that none of the crab earnings of the previously discussed confidential fishermen are provided in the CFEC data. No additional information on costs and net earnings for Chignik Lagoon are available beyond the regional profile presented in the harvest sector discussion. The same trend towards independent vessel ownership financed by private banks and virtual disappearance of cannery owned vessels which is characteristic of Chignik is also true for Chignik Lagoon.

Chignik Lagoon fishermen employ a combination of local kinsmen, other local residents, and nonlocal residents. It is probable that the larger boats fishing more distant waters more likely use crewmen who are neither kinsmen nor other local residents. Salmon crews, in part due to the high crew shares associated with them, tend to remain composed of more kinsmen and local residents. As in the other villages, crewshares have generally declined in the past few years.

Chignik Lake

The community of Chignik Lake is more isolated and fishermen tend to persist in the more traditional salmon-only adaptation than their Chignik and Lagoon neighbors. There is, nevertheless, evidence of increasing diversification in recent years. As indicated in Table 58, the number of

Chignik Lake fishermen grew from four in 1975 and 1976 to 13 in 1980 and 1982. In addition, confidential fishermen begin appearing in 1978. The fishermen had the lowest average gross earnings of any community in the Chignik region in all years except two during the study period. The lowest average gross was $20,600 in 1975 and the highest was $145,600 in 1978. Average gross earnings of Chignik Lake fishermen have lagged well behind those of Chignik Lagoon fishermen in the last three years.

Like other communities in the region, red salmon are far and away the greatest contributor to gross earnings. Table 64 indicates the dependence on this species. Their contribution to total earnings did not fall below 72.5 percent for any year during the study period. At the same time, unlike other communities, chum and coho made relatively smaller contributions to earnings. Table 60 indicates that a single Chignik Lake fisherman harvested halibut in 1980 and again in 1982. In 1982 and 1983, sac roe herring were pursued by one and two persons respectively. There is no evidence of either king or tanner crab harvests; likely reasons for this include the fact that salmon boats are put into storage after salmon season prior to the fishermen returning to their homes for the winter. Since they are not living by the sea during the fall and winter when the crab seasons take place, Chignik Lake fishermen choose not to use their vessels. In addition, none appears to have purchased a larger vessel with which to pursue the crab fisheries more effectively.

No confidential earnings were provided by CFEC for Chignik Lake fishermen for the study period although it is likely that some additional earnings in the confidential fisheries were made. Chignik Lake fishermen do all of their fishing in the Chignik region. Furthermore, the pattern of red salmon dependence noted above indicates that they do little fishing in districts other than Chignik Bay since other districts have greater pink and chum salmon runs. No additional information on costs and net earnings for Chignik Lake are available beyond the regional profile presented in the harvest sector discussion.

The trend toward independence from processors evident in Chignik Bay and Chignik Lagoon is not as pronounced among Chignik Lake fishermen. Although some have become independent vessel owners, they have done so largely by purchasing vessels previously owned by the canneries. They have also retained ties with processors, primarily the Columbia Wards operation in Chignik Lagoon. They have not taken steps as yet to purchase larger vessels in order to further diversify their fishing efforts. Chignik Lake fishermen appear to follow the domestic mode of production more intensively than their neighbors at Chignik and Chignik Lagoon. In addition to household members and local kinsmen, Chignik Lake fishermen also hire crew from relatives in Perryville to work on their boats.

TABLE 64
TOTAL GROSS EARNINGS OF CHIGNIK LAKE FISHERMEN BY SPECIES, 1975-1983
(Thousands of Dollars)

	Year								
Species	**1975**	**1976**	**1977**	**1978**	**1979**	**1980**	**1981**	**1982**	**1983**
Red									
# Of Fishermen	4	4	5	7	7	10	7	10	9
Earnings	61.3	220.1	613.9	935.8	584.3	442.3	879.2	900.3	740.3
% Of Total	74.4%	88.2%	86.8%	91.8%	72.5%	86%	94.4%	90.9%	96.6%
Pink									
# Of Fishermen	4	4	5	7	7	7	7	10	8
Earnings	5.3	21.5	71.1	36.7	168.5	33.0	18.7	9.3	6.0
% Of Total	6.4%	8.6%	10.0%	3.6%	20.9%	6.4%	2.0%	.9%	.8%
Chum									
# Of Fishermen	4	4	5	7	7	7	7	10	8
Earnings	4.0	2.7	19.8	32.8	36.0	10.2	19.1	11.9	4.1
% Of Total	4.8%	1.1%	2.8%	3.2%	4.5%	2.0%	2.0%	1.2%	.5%
Coho									
# Of Fishermen	4	4	5	6	7	7	7	10	8
Earnings	11.0	4.8	1.1	7.5	15.3	7.6	7.6	51.5	5.4
% Of Total	13.3%	1.9%	.2%	.7%	1.9%	.8%	.8%	5.2%	.7%
King									
# Of Fishermen	4	4	5	7	6	7	7	9	9
Earnings	.7	.5	1.3	6.3	1.7	7.3	7.3	17.6	10.7
% Of Total	.8%	.2%	.2%	.6%	.2	.8%	.8%	1.8%	1.4%
Totals									
# Of Fishermen	4	4	5	7	7	10	7	10	9
Earnings	82.4	249.6	707.3	1019.0	805.9	514.4	931.8	990.5	766.5

SOURCE: CFEC

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Perryville

The Perryville contingent of fishermen were the most stable over the study period beginning with eight in 1975 climbing to ten in 1981 before dropping back to seven in 1983. The increase that did occur came from bringing inactive salmon permits into the fishery. Although there are confidential fishermen beginning in 1978, the evidence for diversification of Perryville fishermen is very limited.

Over the study period, Perryville fishermen consistently were the second highest average fishermen after Chignik Lagoon (Table 59). In fact in three of the nine study years, Perryville fishermen had the highest average gross earnings of individually reported fishermen. Earnings were lowest in 1975 when they averaged $19,700 gross. Peak earnings were experienced in 1978 with an average gross of $197,800.

Perryville fishermen, like all other Chignik fishermen, are heavily dependent on red salmon (Table 65). They, however, appear to have made somewhat greater use of the other salmon species found in the Chignik region. Prior to 1983, there was no year in which Perryville fishermen obtained over 90 percent of their earnings from red salmon. Table 60 indicates that halibut, pursued by three Perryville fishermen in 1982, and sac roe herring, taken by two fishermen in 1981, are the sole evidence of diversification. There is no evidence of use or purchase of larger vessels or of any crab fishing. A major contributor to this limited amount of diversification is lack of a good anchorage and boat harbor at the village. This requires fishermen to store their boats at one of the facilities in Sand Point prior to moving back home to Perryville in the fall. Lack of access to vessels in the winter precludes involvement in the crab fisheries. Despite the existence of several confidential fishermen, CFEC data do not report any confidential earnings during the study period.

All of Perryville fishermen's harvests appear to be taken from Chignik region waters. Perhaps due to the community's location, Perryville fishermen consistently harvest significant quantities of pinks, cohos, and chums from districts other than the Chignik Bay district.

Perryville fishermen have become independent vessel owners since 1975 by purchasing previously cannery-owned vessels and other newer ones. The purchase of new vessels has largely been accomplished through private banks. Ties with processors are still important due to the necessity of storing vessels and gear at Sand Point over the winter. The domestic mode of production is still very powerful among Perryville fishermen. At least one fisherman is reported to take five or six relatives as crew on vessels that are normally crewed by two or three men in addition to the captain. Several Ivanof Bay individuals also crew on Perryville boats.

TABLE 65

TOTAL GROSS EARNINGS OF PERRYVILLE FISHERMEN BY SPECIES, 1975-1983

	Year								
Species	**1975**	**1976**	**1977**	**1978**	**1979**	**1980**	**1981**	**1982**	**1983**
Red									
# Of Fishermen	8	6	7	7	5	6	8	6	7
Earnings	131.8	335.2	1017.5	1115.7	559.9	321.6	1101.4	699.5	897.9
% Of Total	83.6%	89.5%	85.9%	80.6%	67.2%	72.5%	83.5%	88.4%	97%
Pink									
# Of Fishermen	8	6	7	7	5	6	8	6	7
Earnings	5.4	23.6	124.6	191.3	195.7	41.2	150.1	11.7	6.7
% Of Total	3.4%	6.3%	10.52%	13.8%	12.5%	9.3%	11.4%	1.5%	.7%
Chum									
# Of Fishermen	8	6	7	7	5	6	8	6	7
Earnings	6.2	8.1	36.3	64.8	51.8	55.8	40.0	35.8	4.3
% Of Total	3.9%	2.2%	3.1%	4.7%	6.2%	12.6%	.3%	4.5%	.5%
Coho									
# Of Fishermen	8	6	7	7	5	6	8	6	7
Earnings	13.7	5.3	4.1	5.1	24.7	18.6	21.1	34.4	5.4
% Of Total	8.7%	1.4%	.3%	.4%	3.0%	4.2%	1.6%	4.3%	.6%
King									
# Of Fishermen	8	6	7	7	5	6	8	6	7
Earnings	.6	2.1	1.7	8.0	1.4	6.3	6.0	9.8	8.3
% Of Total	.4%	.6%	.1%	.6%	.2%	1.4%	.5%	1.2%	.9%
Totals									
# Of Fishermen	8	6	7	7	5	6	8	6	7
Earnings	157.7	374.3	1184.2	1384.9	833.5	443.5	1318.6	791.2	922.6

SOURCE: CFEC

Ivanof Bay

No individual reported earnings were obtained from Ivanof Bay since only two residents of that community hold permits. As indicated in Table 60, prior to 1979 those two individuals did not appear as Ivanof Bay residents and only since 1981 have both appeared in CFEC records. Table 60 also indicates that one Ivanof Bay individual set gillnet in 1975; this likely occurred in Stepovak Bay in the Peninsula-Aleutians district which begins just west of Ivanof Bay. The two Ivanof Bay fishermen fished for halibut in 1982, the only evidence of fisheries diversification apparent for this community.

Summary

Within the Chignik region, two basic groupings of communities in relation to commercial fisheries are apparent. First, there is a traditional group composed of Chignik Lake, Perryville, and Ivanof Bay whose fishermen are almost totally dependent on salmon fishing. There are no large boats owned or used by these fishermen and there is no evidence of crab fishing in the winter by any of them. Evidence for diversification into other fisheries is sparse with several fishermen in each community seeking halibut or sac roe herring, usually since 1980. In conjunction with this more traditional species orientation one finds greater reliance on kinsmen for crew (domestic mode of production). It also appears that fishermen from these communities tend to have continued ties with processors for vessel and gear storage and certain other services despite the fact that they have now become independent owners of their own vessels.

The other group of communities consisting of Chignik Bay and Chignik Lagoon have more diversified fishermen who have pursued king and tanner crab consistently, in some cases, dating back into the 1970s. One has even begun fishing dungeness crab, a quite rare undertaking. In addition, it appears that one or two of the more successful Chignik and Chignik Lagoon fishermen have purchased larger (greater than 50 foot) vessels primarily for crab fishing. Finally, fishermen from these communities have pursued halibut outside the Chignik region and at least one has traveled to Dutch Harbor and the Bering Sea to participate in the crab fishery. Fishermen from Chignik and Chignik Lagoon tend to hire more nonrelatives and nonlocal crewmen although there still is strong reliance on kinsmen for salmon fishing. Ties with processors appear to be very weak as these fishermen bargain independently with local and outside processors to maximize their economic position in the fishery.

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III. SUBSISTENCE ACTIVITIES

by Stephen J. Langdon, Ph.D.

Introduction

Subsistence activities involving production and consumption of fish, animal, and plant resources are an important component of community life in the Kodiak and Chignik regions. In the rural communities especially, subsistence continues to be an important principle ordering residents' lives and channeling their participation in other economic activities. In the majority of the villages of the study area, commercial fishing and subsistence activities are integrated to provide a distinctive character to life in the communities.

In this chapter, the subsistence activities and patterns of study area communities are described and analyzed. Subsistence activities are characteristic of all communities in the Kodiak and Chignik areas, although the nature of patterns of participation varies between areas and communities. Topics discussed in the chapter include area and community differences, seasonal round and species pursued, harvest and consumption levels, the organization of distribution and exchange patterns (including intercommunity and interregional patterns), technologies used in production, and the geographic location of harvests. Information from recent research on subsistence activities elsewhere in Alaska is offered to indicate the position of Kodiak and Chignik villages with regard to subsistence patterns relative to other Alaskan communities.

Data Sources

The data base on subsistence activities is much better for Kodiak than it is for Chignik area communities because there is a longer time series of ADFG salmon subsistence permit data and because of a detailed 1983 subsistence harvest and exchange survey commissioned and administered by the Kodiak Area Native Association with Bureau of Indian Affairs money and designed and analyzed by ADFG Subsistence Division personnel. Partial data on subsistence harvests from a survey of Chignik area communities conducted by the Subsistence Division in 1982 and 1983 have been obtained and are presented in their preliminary form in this report. Some additional information on subsistence costs and exchange patterns was obtained through fieldwork conducted for this study.

Subsistence Activities and Subsistence Systems

Recent research by the Subsistence Division of the Alaska Department of Fish and Game has found differences in patterns between communities around the state. One particularly important distinction is that certain communities display what has been labelled a "subsistence-based" socioeconomic system (Wolfe and Ellanna 1983:251). These communities are distinguished from others labelled either market or industrial-welfare socioeconomic systems. There appear to be intermediate systems as well.

Two important qualifying remarks are in order prior to elaborating on the distinction between these two types of socioeconomic systems. First, the term "subsistence" does not mean that these are cashless communities with no links to market systems. They are mixed economies in which cash plays an important role by providing the opportunity for modern harvesting technologies to be used. Rather, it is the use of cash that distinguishes subsistence-based socioeconomic system from the industrial-welfare socieconomic system. Second, the characteristics of these systems extend beyond the individual harvester or household. Thus, although there may be subsistence users in industrial-welfare communities (whose subsistence patterns are similar to those of individual households found in subsistence-based systems), their pattern is unusual in the industrial-welfare system while it is typical in the subsistence-based system. There are also likely constraints on the full social realization of the subsistence-based system pattern of functioning for the individual household in an industrial-based community. Before examining subsistence in Kodiak and Chignik area communities it is important to note the differences between these two types of systems. The subsistence-based system has several key characteristics (Wolfe and Ellanna 1983:272):

1) a 'mixed economy' with mutually supportive 'market' and 'subsistence' sectors;

2) a 'domestic mode of production' where capital, land, and labor are controlled by extended, kinship-based production units;

3) a stable and complex 'seasonal round of production activities' within the community tied to the seasonal arrival and fluctuations of fish and game resources;

4) substantial non-commercial networks of sharing, distribution, and exchange of food and materials;

5) traditional systems of land use and occupancy; and

6) ...systems of beliefs, knowledge, and values associated with resource uses passed on between generations as the cultural and oral traditions of a social group.

In addition to these characteristics, subsistence activities in subsistence-based communities make use of a wider range of species, harvest substantially greater quantities of resources, and engage in subsistence activities for a greater amount of time than is characteristic of subsistence users in industrial-based systems.

Industrial-welfare systems and their pattern of subsistence resource utilization are opposite to subsistence-based systems on all but perhaps the last characteristic. Subsistence users in industrial-welfare communities do have systems of beliefs and values associated with resource uses and they too can be different from those of subsistence-based system users.

Subsistence Division researchers also have found intermediate kinds of community adaptations. Their case studies reveal that rural regional centers (one specific case studied was Nome) appear to exhibit continuance of subsistence-based socioeconomic systems characteristic of villages in the region; however, regional centers have heterogeneous populations, often divided into subpopulations in terms of subsistence strategies, and they have a greater wage labor base than is found in villages. Finally, Subsistence Division research in Sitka revealed an industrial-welfare system which exhibited certain features characteristic of the subsistence-based system. Noteworthy was the relative breadth of species, the high quantities of harvest, and significant networks of exchange. Both the regional center pattern and the Sitka pattern are relevant to understanding the pattern of subsistence activities characteristic of Kodiak city.

REGIONAL AND COMMUNITY PATTERNS

The study area comprises two regions: the Kodiak region and the Chignik region. The Kodiak region, for purposes of this analysis, is divided into Kodiak City and its road-connected environs and the six outlying villages. Within the Chignik region are five villages. The subsistence patterns are discussed for these three units: Kodiak city and environs, the Kodiak villages, and the Chignik villages. Within each of these groupings, village or subpopulation differences are identified where they are important. For example, the Kodiak subsistence survey allows identification of village differences in subsistence harvesting and distribution strategies and also provides information on subpopulations in the Kodiak city area.

SPECIES AND SEASONAL ROUND

The following species are the most important in the subsistence harvests of Kodiak residents (KANA/ADFG 1983):

FISH	Salmon: king, red, silver, pink, and dog Halibut Cod Dolly Varden Steelhead
INTERTIDAL	Butter clams, cockles, chitons
SHELLFISH	Crab: king, tanner, dungeness

TERRESTRIAL MAMMALS	Deer Rabbit Brown bear
MARINE MAMMALS	Harbor seal Sea lion
BIRDS	Ptarmigan Ducks (no further species breakout provided) Geese (no further species breakout provided)
PLANTS	Berries (no further species breakout provided) Greens (no further species breakout provided)

The species harvested by Chignik area residents are similar to the Kodiak area species mix with several additions and deletions due to the Chignik communities location on the Alaska Peninsula. Major additions to the Chignik subsistence resources are caribou, moose, and spruce grouse while deer and steelhead are not available on the mainland.

Resources used for trapping--fox, wolf, and beaver, for example--are not included in this inventory.

The seasonal round of subsistence pursuits is similar for the two areas as depicted in Figure 12. The intent of this Figure is to provide a general indication of the most intensive period of harvest for each resource. Seasonal harvest of resources is controlled by a number of factors including by resource availability (salmon, ducks, geese, berries), by resource suitability (crab, clams, bear, greens), by weather (marine mammals) and by governmental regulations (deer, caribou, moose, ducks, geese). In addition, other factors such as personal preferences, costs, and technological requirements are involved in decisions about which resources to pursue.

HARVEST LEVELS

Documentation of subsistence harvest levels of different resources is extremely scarce. The lack of any longitudinal data and concerns about the reliability of permit self-report data make analysis a difficult if not impossible task. A recent survey of Kodiak area residents, however, provides a substantial amount of information previously unavailable for these communities. A household survey conducted by the Subsistence Division in Chignik communities is being analyzed at present; preliminary figures from that research are presented below.

The Alaska Department of Fish and Game permit system for subsistence salmon harvests has been in effect in the Kodiak area since 1962 and in the Chigniks only since 1976. The permits are self-report instruments that were in essence voluntary since no penalty was given for failure to return a permit catch level report until 1976. Data for Kodiak has traditionally been reported in management reports by stream or district, not by community. For the Chignik area, total estimated figures for all villages

FIGURE 12
SEASONAL ROUND OF SUBSISTENCE RESOURCE HARVESTS: KODIAK AND CHIGNIK AREA COMMUNITIES

Resource	Jn.	Fb.	Mr.	Ar.	My.	Jn.	Jl.	Ag.	Sp.	Ot.	Nv.	Dc.
Salmon:												
king						-	-					
red					-	-	-	-				
silver							-	-	-	-		
pink							-	-				
dog							-	-	-			
Halibut	-	-	-	-	-							
Dolly Varden						-	-	-	-	-		
Steelhead				-	-				-	-	-	
Butter clams		-	-						-	-	-	
Crab:												
king												
tanner												
dungeness												
Deer	-	-	-					-	-	-	-	-
Caribou	-	-						-	-	-		
Moose	-	-							-			
Rabbi	-	-								-	-	-
Brown bear								-	-			
Harbor seal			-	-	-	-	-	-				
Sea lion	-	-	-	-	-	-	-	-	-	-	-	-
Ptarmigan	-	-	-	-	-	-	-	-	-	-	-	-
Spruce grouse	-	-	-	-	-	-	-	-	-	-	-	-
Ducks	-	-								-	-	-
Geese				-	-					-	-	-
Berries								-	-			
Greens				-	-	-						

SOURCE: ADFG, Southwest Regional Guide, 1985

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combined are presented for some years. ADFG considers the figures to be estimates only and in no way are they to be construed as accurate harvest figures. Most would consider the estimates bottom line minimums. The KANA survey report indicates that returns from the permits have been poor and "therefore harvest and effort data derived from the permits is probably not reliable" (KANA 1983: 90).

The only other important subsistence species for which some time series measure of harvest are available are caribou, deer, and moose. Harvests of these species are recorded by self-report and typically are reported on the basis of the game management unit in which the species was taken and whether the harvester was an Alaskan resident or not. Although returns are thought to be better for deer, caribou, and moose than for salmon, similar concerns about the reliability of the data for estimating harvest levels are expressed by many Kodiak area residents.

Salmon Subsistence Permit Data

Data from the Kodiak area salmon subsistence permit data are reported in Table 66. Among other things, the data indicate a steadily increasing demand for subsistence permits and presumably salmon. In 1983, 1307 salmon permits were issued, the largest number ever, indicating that demand in terms of numbers of users continues to increase. Certainly increase in the population of Kodiak area communities over the past 20 years is sufficient to account for a substantial increase in the number of subsistence permits issued and the size of the reported subsistence catch. The data also indicate that red salmon are by far the preferred species with silvers being second most popular. These species are not particularly abundant in Kodiak area streams and limits on the subsistence catch of each may be placed in the future. The more abundant pink and dog salmon are less preferred due to their rapid loss of quality in freshwater where the majority of subsistence catches are made. Reds and silvers, on the other hand, retain their oil content and their quality for a longer period after entering freshwater on their return to their spawning grounds and live longer in the freshwater environment than do the other two species.

The Kodiak data show a range of average number of salmon taken per permit of from a high of 126.9 in 1963 to a low of 25.8 per permit in 1979. The overall trend since 1962 has been for a decrease in the number of fish reported taken per permit. Prior to 1967, the average was about 100 fish per permit, but in 1968 the average fell to 59.5. From 1968 to 1973 the average fluctuated between 50 and 65 fish per year, but if fell to 44.2 in 1974. Since 1978, average fish per permit has been between 25 and 30 each year. According to this data, increasing numbers of users are resulting in rapidly expanding total subsistence catches (more than doubled from 1977 to 1982) while the average catch per permit has dropped from 100 to 25 fish per permit over the 20-year period.

The rate of return of permits has increased substantially in recent years largely due to a new requirement instituted in 1976 that subsistence permits will not be issued to persons who obtained one previously and failed to return a completed form to ADFG. This policy and the desire by many to establish a record of use have probably improved the quality of the permit data. Table 67 presents ADFG subsistence permit data available for the Chignik area. As is apparent, data is available for a much shorter period of time than from the Kodiak area. Similarly to Kodiak, however, red salmon are the preferred subsistence specie although unlike Kodiak, red salmon are the dominant species in the commercial catches of the district in most years.

TABLE 66

KODIAK AREA SUBSISTENCE SALMON HARVEST
ADFG ESTIMATES: 1962-1982
(Number of fish from permits only)

YEAR			SPECIES				TOTAL
	Permits*	Kings	Reds	Silvers	Pinks	Dogs	
1962	74/13	0	0	433	397	20	850
1963	74/15	0	297	576	836	195	1904
1964	43/9	6	332	184	88	71	681
1965	67/7	2	19	318	244	12	595
1966	48/13	0	295	331	334	393	1353
1967	84/29	2	1306	571	894	344	3117
1968	132/28	0	658	433	529	45	1665
1969	242/30	1	481	338	620	30	1470
1970	213/49	1	959	939	797	265	2961
1971	267/131	5	3442	1720	1276	472	6915
1972	329/176	11	3633	1531	2516	2729	10420
1973	400/149	7	4453	2289	1393	1166	9308
1974	367/90	1	1909	846	1094	128	3978
1975	508/90	1	1141	922	947	221	3232
1976	536/243	4	4338	962	2275	370	7949
1977	739/451	54	8119	2508	2849	317	13847
1978	860/539	50	7239	3699	2747	572	14307
1979	1085/696	111	10376	3840	3300	333	17960
1980	1239/756	67	13746	4407	2755	566	21581
1981	1166/733	44	12756	3729	2278	470	19277
1982	1276/993	110	16615	7192	3558	667	28143

* The first figure is the number of permits issued and the second is the number of permit reports returned.

SOURCE: 1983 Annual Finfish Management Report, Kodiak Management Area, p. 266.

Cultural Dynamics 1986

Average fish reported taken per permit for the six years sufficient data is available to compute such a figure shows a range from a low of 34.3 in 1982 to a high of 254.2 in 1983. These erratic fluctuations are likely evidence of the weakness of the measure more than any other factor. With the exception of 1982 which appears to be an anomaly, the average number of fish taken per permit was more than 125 for each of the other five years.

KANA Survey Harvest Data

The KANA survey provides numbers and weights of selected subsistence resources. The findings were based on recall interviews conducted with a high percentage of households in the rural villages and a sample in the

TABLE 67

CHIGNIK SUBSISTENCE SALMON HARVEST
ADFG ESTIMATES: 1976-1983

YEAR	SPECIES						TOTAL
	Permits*	Kings	Reds	Silvers	Pinks	Dogs	
1976	**	100	6000	1500	500	150	8250
1977	***	50	9700	2400	1800	600	14,550
1978	NA	60	6015	900	4100	1100	12,175
1979	NA	14	7750	34	261	0	7725
1980	67/37	9	7828	27	400	141	8405
1981	27/7	100	5840	0	0	0	5940
1982	68/15	2	2320	8	1	0	2331
1983	32/20	0	3438	1880	1680	1136	8134

* Beginning in 1980, ADFG reports include the number of subsistence permits issued and the number returned. Harvest levels from 1980 are based on extrapolation of figures obtained from returned permits to total permits issued.

** 50 families were estimated to catch and use salmon for subsistence and figures are an approximate total subsistence harvest.

*** 90 families were estimated to catch and use salmon for subsistence and figures are an approximate total subsistence harvest.

SOURCE: Annual Management Reports, Chignik Management Area, 1975-1983.
Cultural Dynamics 1986

Kodiak road-connected area. Table 68 displays mean household harvests by Kodiak rural community residents, and Table 69 presents the same information for subpopulations in the Kodiak road-connected area. Both Tables 68 and 69 are for the 1982-83 period. Salmon are a relatively abundant resource in the Kodiak archipelago. Because they appear regularly in freshwater streams, access to them is fairly high, particularly in the road-connected area. In the rural areas, access may require skiffs or boats if streams are not close by the community. Salmon harvest figures for the Kodiak rural communities range from a high of 493.4 in Karluk to a low of 61 in Port Lions. Port Lions and Ouzinkie, the two communities closest to Kodiak city, have the lowest averages. Intermediate averages ranging from 156.6 to 214.5 are characteristic of Larsen Bay, Old Harbor, and Akhiok. These figures indicate a substantially greater level of salmon subsistence use by Kodiak rural residents than are revealed by the ADFG salmon subsistence permit data for the entire Kodiak region population.

Salmon subsistence harvests by residents of the Kodiak road-connected area are well below averages for rural residents. The highest harvest among road-connected groups is that reported for the Chiniak sample, an outlying region 15 miles northwest of Kodiak city, at 52.4 fish. The second highest is the Kodiak city Native subpopulation which has a household average of 40.5 fish. The lowest salmon harvesting figures are reported for the Coast Guard sample at 15.9 fish. The overall average figure for the road-connected sample was 28.2 fish, almost exactly the same as the ADFG permit average of 28.3 fish for the same year, 1982. Because the ADFG subsistence permit data is similar to the KANA data from the Kodiak road-connected populations, it appears that the ADFG permit data is more representative of the road-connected than of the rural area. The virtually identical figures derived from two different sources give substantial support to the reliability of the figures for the Kodiak road-connected area. The rural figures are less reliable because of the single data source available for them.

The species composition of the salmon subsistence harvests are also provided in Tables 68 and 69. It will be recalled that ADFG subsistence permit data indicated that red salmon were by far the predominant species harvested with silver salmon a distant second. The KANA data reveal a more complicated pattern at considerable variance with the subsistence permit data. First, the KANA data indicate greater use of pink and dog salmon. It is possible that people don't report their pink and dog use because of the abundance of these species in local streams. Second, KANA and ADFG data are in greater agreement on species composition among Kodiak road-connected area populations than they are for the rural communities. There is general agreement on the red and silver order of preference among the road-connected groups with only the Chiniak sample differing in its significantly higher level of silver use. This is likely the result of a number of good silver salmon streams in the Chiniak area and a lack of sockeye streams in the area.

Among the rural users, wide variation occurs from community to community in the species mix. Again, Ouzinkie and Port Lions exhibit a composition pattern similar to the road-connected areas with red being the most numerous subsistence species and silver second. In the four other villages, however, pink salmon are more numerous than silver salmon and in two communities (Akhiok and Old Harbor), pink salmon are the most numerous species cited. In Karluk and Larsen Bay red salmon are the most numerous with pink second and silvers third. Old Harbor's pattern is distinctive both in the relative lack of red salmon and in the primacy of pinks. Old Harbor also has the highest reported harvests of dog salmon.

To a certain extent the rural community patterns are a result of the local availability of species. Karluk is located on one of Alaska's greatest salmonid producing systems which helps account for the abundance of salmon and steelhead use by residents of this community. Old Harbor, on the other hand, does not have a major sockeye producing system in close proximity, so consequently residents concentrate on the ubiquitous pink and dog salmon that are found nearby.

There is another factor apparent in the species composition figures. Pink and dog salmon are generally less preferred because of their lower oil content and rapid declines in quality once they enter freshwater. Dogs,

TABLE 68

MEAN HOUSEHOLD HARVEST OF SELECTED SPECIES IN NUMBERS, KODIAK RURAL COMMUNITIES, 1982-1983[1,2,3]

	Akhiok	Karluk	Larsen Bay	Old Harbor	Ouzinkie	Port Lions
Number Households Surveyed	21	20	32	76	32	55
Salmon:						
Red	81.4	315.0	84.1	7.5	45.0	25.3
King	0.0	18.6	2.6	1.2	.9	.4
Silver	31.7	73.4	24.6	56.3	31.4	25.0
Pink	85.2	84.9	41.1	74.7	19.1	8.7
Chum	16.2	1.4	4.2	40.6	16.2	1.6
TOTAL SALMON	214.5	493.4	156.6	180.3	112.6	61.0
Halibut	2.6	4.9	5.3	5.9	3.1	7.7
Dolly Varden	13.8	41.5	24.7	6.6	25.4	7.4
Steelhead	.1	11.6	8.5	1.4	4.5	.3
Butter Clams#	4.5	2.5	9.3	4.2	4.2	3.7
Crab:						
King	18.5	1.3	6.7	9.2	26.0	20.3
Tanner	2.7	1.2	3.7	3.0	3.2	6.3
Dungeness	.5	2.0	7.6	4.9	7.1	11.1
Deer	3.6	5.4	5.8	5.5	2.6	2.6
Rabbit	.5	2.6	1.8	1.6	3.4	2.5
Ptarmigan	5.5	8.9	2.2	1.5	0.0	.3
Ducks	31.8	46.4	21.7	20.8	37.1	10.0
Geese	9.4	.1	.1	2.1	3.2	0.0
Harbor Seal	3.3	2.5	1.3	1.7	1.4	.1
Sea Lion	2.0	1.0	.8	1.0	.2	.1

Cultural Dynamics

1. Harvest in numbers except clams which are in 5 gal. buckets.
2. Data are for a 12 month period, most often from June 1982 through May 1983. See methodology section for details
3. Because of rounding and the computer techniques used to deal with missing data, the column, row, and category totals may not always equal 100% or the totals expected from the addition of constituent numbers.

Source: Data from KANA 1983 survey; table prepared by Subsistence Division, Alaska Department of Fish and Game.

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TABLE 69

MEAN HOUSEHOLD HARVEST OF SELECTED SPECIES IN NUMBERS, KODIAK ROAD-CONNECTED AREA, 1982-1983[1,2,3]

KODIAK ROAD-CONNECTED AREA

	General Sample[4]	Coast Guard	Chiniak	Filipino	Native
No. Households Surveyed	155	76	17	34	35
Salmon:					
Red	11.7	3.1	13.9	10.4	16.6
King	.3	.2	1.9	.0	.4
Silver	9.4	4.3	23.4	10.4	13.3
Pink	7.1	7.4	8.9	2.8	9.0
Chum	1.2	.9	4.3	.4	1.2
TOTAL SALMON	29.7	15.9	52.4	24.0	40.5
Halibut	4.9	6.8	4.4	2.6	1.6
Dolly Varden	8.5	14.4	5.1	23.0	4.3
Steelhead	.6	2.8	1.4	2.3	2.3
Butter Clams	1.6	1.0	4.2	3.6	3.5
Crab:					
King	7.2	10.6	17.3	.8	4.2
Tanner	4.4	4.7	4.1	1.6	.8
Dungeness	3.2	3.2	4.5	1.4	2.2
Deer	1.3	.6	4.4	1.0	1.5
Rabbit	1.2	1.6	3.4	1.2	1.4
Ptarmigan	.7	.6	.4	1.0	.8
Ducks	.8	.2	3.6	1.1	2.7
Geese	.0	.1	.2	0.0	1.5
Harbor Seal	.1	0.0	.1	0.0	0.0
Sea Lion	.0	0.0	.1	0.0	0.0

1. Harvest in numbers except clams which are in 5 gal. buckets.
2. Data are for a 12 month period, most often from June 1982 through May 1983. See methodology section for details
3. Because of rounding and the computer techniques used to deal with missing data, the column, row, and category totals may not always equal 100% or the total expected from the addition of constituent numbers.
4. General Sample data are from a random sample of all road connected areas including, Kodiak City, Service Area One, Bells Flats, Women's Bay, and Monashka Bay, but excluding Chiniak and Pasagshak.

Source: Data from KANA 1983 survey; table prepared by Subsistence Division, Alaska Department of Fish and Game.

however, are valued if you are drying fish precisely for this lower oil content. The lower oil content allows quicker processing time and less likelihood for spoilage. The ubiquity of pink and dog make them readily accessible through dip nets, rod and reel, or even by hand. So they are inexpensive to harvest and children can catch them. In communities with low household and per capita earnings, they provide a cheap supply of protein. In communities with higher household and per capita earnings, pink and dog salmon tend to be less important.

In addition to salmon, Kodiak area residents make substantial use of a wide variety of other marine and freshwater resources. The KANA survey indicates that halibut, dolly varden trout, and steelhead are other resources used by Kodiak area residents. Steelhead and dolly varden trout are available in freshwater streams on Kodiak Island. The average number of steelhead caught in 1982 by the road-connected area sample population was 1.5 fish while the average for the rural village sample was 3.3 fish. Among the road-connected populations, the Coast Guard sample reported the highest average harvest of 2.8 while the general sample was lowest at .6 fish. In the rural communities, high harvests were reported by Karluk (11.6) and Larsen Bay (8.5) residents and low harvests by Akhiok (.1) and Port Lions (.3) residents.

Dolly varden harvests averaged 10.8 fish for the road-connected population and 15.4 fish for the rural sample. Highest harvests among the road-connected groups were found among the Filipino population (23.0) and the Coast Guard (14.4) while the lowest harvest was reported by the Kodiak city Native group (4.3). In the rural communities, Karluk had the highest average harvest by far at 41.5 fish while Old Harbor had the lowest at 6.6 fish. Dolly varden tend to be numerous and available in virtually every salmon spawning stream because of their habit of feeding on salmon eggs and fry. They are easily caught with rod and reel and are often pursued by children. Although not a highly valued species, they are cheap, quality protein. The low average harvest of dolly varden by Old Harbor residents is somewhat puzzling but may be the result of local availability or taste. Steelhead, on the other hand, are relatively few in number and found in fewer streams. They are a popular resource that are considered by sportsmen difficult to catch on rod and reel. The level of harvest of steelhead is thus largely controlled by local supply and, to a lesser extent, by ability. Karluk's harvest level is a result, in part, of its proximity to a good supply.

Clams are an important intertidal resource used by all Kodiak area populations. Difficulty in accessing clams is similar to freshwater resources. Some beds may require only walking to reach from a community while others may be at a distance or on small islands or reefs and require skiffs or boats. The average harvest figures reported by the road-connected sample was 2.0 five-gallon buckets per year while rural residents averaged 4.7 buckets per year. Highest harvests among the road-connected groups was 4.2 buckets by Chiniak residents while the lowest was 1.0 by Coast Guard personnel. In the rural communities, highest harvests were reported by Larsen Bay residents at 9.3 buckets while the lowest amount taken was by Karluk residents, 2.5 buckets. In general, clams are relatively inexpensive to harvest if a good supply is nearby. Low levels of use probably indicate that clams are used primarily for diet variation and are not preferred. High levels of use may be due to the low costs of clamming.

Halibut are a bottom-dwelling species available only by marine fishing. During the winter months they stay in deeper waters but move into shallower waters in April and May for spawning. Access to halibut is more difficult; that is, costs of harvest are higher on average, than for freshwater and intertidal resources. For halibut the average for the entire road-connected sample was 4.7 fish per year with the Coast Guard showing the greatest use at 6.8 and the Kodiak city Native population showing the lowest at 1.6. For the rural communities, the overall mean was 5.5 fish, indicating slightly more use among rural residents than among road-connected area residents. Substantial variation was seen between rural communities with Port Lions (7.7) and Old Harbor (5.9) having the highest harvests while Akhiok (2.6) and Ouzinkie (3.1) had the lowest. Reasons for the pattern of halibut use by rural communities are unclear. Unlike salmon Ouzinkie and Port Lions do not exhibit the same use pattern, and, although they are the closest rural communities to the road-connected areas, their halibut use patterns diverge in different directions from the road-connected pattern.

Different halibut harvest levels are probably explained by a combination of factors, including good fishing grounds in close proximity to a community, appropriate technology for going out in the open water, and individual tastes. If grounds are close and relatively sheltered, then small open aluminum skiffs with outboard engines may suffice and allow relatively poorer communities to enjoy good halibut fishing. Larger boats may be necessary for some communities if distant from good fishing grounds, but if residents own commercial fishing vessels then access would not be a problem. As a result of this interaction of variables, it is possible for households and communities with different levels of financial resources to exhibit similar patterns of halibut use.

Three species of crabs found in Kodiak area waters are used by residents for subsistence purposes. All require access to skiffs or boats for harvesting and therefore are similar to halibut in their general accessibility. Road-connected Kodiak residents harvested an average of 14.3 crabs in 1982-83 including 7.5 king crab, 3.8 tanner crab and 3.0 dungeness crab. Chiniak residents reported highest harvest levels at 25.8 crabs overall dominated by 17.3 king crabs. The Filipino population had the lowest crab harvests with an average of only 3.8 per household, and only .8 king crab.

The rural sample averaged 24 crabs per household including 13.9 king crab, 3.7 tanner crab, and 6.4 dungeness crab. Highest harvests were reported by Port Lions and Ouzinkie residents at 37.7 and 36.3 crab respectively. In both communities households preferred king crab--the average was over 20--while dungeness crab were the second most frequently taken. The lowest harvest of crab was reported by Karluk with only 4.5 crabs taken.

Rural harvests are generally higher than road-connected harvests, but there are substantial differences between populations in both groups. The Chiniak population most closely approximates the rural use pattern as it does for a number of other resources. The high harvest levels of Port Lions and Ouzinkie residents reflects proximity to good crabbing grounds and the availability of technology--vessels and pots with which to catch the crabs. Both communities have a number of residents who are commercial crab fishermen. Karluk's low levels of harvest are the result primarily of the lack of technology, but distance from the grounds is also a secondary factor.

Marine mammals, primarily sea lion and harbor seal, are also used by many residents, particularly in the rural areas. Getting these resources is probably the most difficult of all; technology (vessel and rifle), knowledge of species behavior, and hunting skill to kill or capture are required to utilize these resources. These skills are predominantly found among Alaskan Native (Koniag) residents. Use of marine mammals by residents of the road-connected area is virtually nil with only the Chiniak population displaying a trace of use of both harbor seal and sea lion. The general sample indicates only a trace use of harbor seal. Among rural residents, however, use is substantially greater with an average of 1.44 harbor seals per household and .74 sea lions. Highest harvests were reported for Akhiok with 3.3 seals and 2.0 sea lions. At the other end of the continuum, use in Port Lions approximates that of the road-connected area with mean household harvests of .1 for both harbor seal and sea lion.

Although there are no specific data on the topic, sea mammal usage differences among rural villagers probably result from several factors. Two appear to be the persistence of hunting knowledge and taste preferences for marine mammal products. A third factor is availability. While harbor seals tend to be fairly evenly distributed, sea lion abundance is highly concentrated. If harvests primarily occur at rookeries or haulouts, then the location of these sites in regard to the communities will be a critical determinant of use.

Waterfowl (ducks and geese) are a highly seasonal resource with specific environmental requirements. Accessibility to waterfowl depends on community proximity or road access to resting areas as the majority of available birds are simply transient to Kodiak on their travels north and south. There are substantial differences in the harvest patterns of waterfowl between road-connected and rural populations. The road-connected population makes very little use of waterfowl averaging only 1.0 ducks per household and almost no geese. Use of these resources is greatest among the Chiniak and Kodiak city Native samples. The rural communities display much greater use averaging 2.0 geese and 23.8 ducks per household harvest. Akhiok, Karluk, and Ouzinkie are the most intensive harvesters of ducks and geese while Port Lions is the least intensive.

Ptarmigan are an upland terrestrial bird resource widely distributed, generally abundant, and relatively easy to hunt even though small. They are taken by residents of the road-connected area and rural communities but appear to make little dietary contribution anywhere. Households in the road-connected areas had .7 ptarmigan as a mean while rural households averaged three times that many (2.1) birds.

Rabbits are an abundant, widely distributed small terrestrial game resource which is highly accessible. In the road-connected area, households averaged 1.4 rabbits while rural households harvested 2.1 on average.

Deer are the most important terrestrial resource to Kodiak residents. Their numbers have grown in recent years thanks to mild winters with little snow buildup. Hunting them requires greater effort and ability than ptarmigan or rabbits, but provides a substantially greater return per unit harvested. Although deer are available near most rural communities, the majority of rural hunters use a boat or skiff to hunt them in areas at a greater distance from the communities, often in the wintertime on the beaches.

In the road-connected areas, households harvested an average of 1.3 deer. Use was high among the Chiniak population who averaged 4.4 deer harvested per household while the Coast Guard reported only .6 deer taken. Reported harvests of deer were more than 300 percent higher in rural communities than in road-connected populations with an average of 4.3 deer per household taken. Deer harvests were greatest in Larsen Bay, Old Harbor, and Karluk; households in each of these communities averaged over five deer taken. The lowest rural average were reported by residents of Ouzinkie and Port Lions with 2.6 deer per household for both communities.

Food Weights of Fish and Game Harvests

A measure of the relative contribution of different subsistence resources to the diets of Kodiak households can be obtained by converting numbers of animals taken into their consummable food weights. Tables 70 and 71 present data on the mean household food weight of subsistence harvests for Kodiak rural communities and the road-connected area. Conversion rates for different resources are taken from ADFG area management reports, Subsistence Division research reports, and estimates by researchers involved in the KANA survey project.

The total average food weight of harvested fish and game for Kodiak rural communities is 1,611 pounds per household. This figure was computed from Table 70 by multiplying the number of surveyed households in each community by the community's all-species household mean food weight, summing these community totals and dividing by the total number of rural households surveyed. The highest figure was reported for Karluk with 3296 pounds; as is apparent from Table 70, this is the result of the extremely large harvests of salmon reported by Karluk residents. At the low end of the range is Port Lions whose household mean of 866 total pounds is the only community with less than 1,000 pounds total mean harvested food weight. Despite variations in household size between communities, mean per capita food weights follow the same order of ranking from high to low as does mean total household harvest food weights.

TABLE 70

MEAN FOOD WEIGHT OF FISH AND GAME HARVEST PER HOUSEHOLD, PER CAPITA FOOD WEIGHT, KODIAK RURAL COMMUNITIES, 1982-1983[1,2,3]

	Akhiok	Karluk	Larson Bay	Old Harbor	Ouzinkie	Port Lions
No. Households Surveyed	21	20	32	76	32	55
Species Group						
All Salmon	845.0	2223.2	663.2	795.9	522.5	287.1
All Fish	954.5	2532.2	936.9	1034.5	707.2	580.9
All Crab	47.2	6.5	26.6	29.6	69.9	64.6
All Invertebrate	185.3	62.1	190.0	121.0	163.6	118.6
Deer	156.3	235.4	251.1	235.9	110.7	113.1
Marine Mammals	547.9	324.7	227.8	281.0	93.0	24.7
Small Game	131.2	128.0	59.7	66.6	115.9	30.3
All Game	835.4	702.0	538.6[4]	606.6	325.6	168.1
All Species	1975.2	3296.3	1665.5[4]	1758.3	1196.3	865.9
Mean Household Size (persons)	3.81	3.95	4.16	3.79	3.34	3.30
Per Capita Food Weight of Harvest	518.4	834.5	400.4	463.9	358.2	262.4

1. Food weight given in pounds, converted from harvest number using standard conversion factors, see Table 21.
2. Data are for a 12 month period, most often from June 1982 through May 1983. See methodology section for details.
3. Because of rounding and the computer technique used to deal with missing data, the column, row, and category totals may not always equal 100% or the total expected from the addition of constituent numbers.
4. Adjusted total for Larsen Bay, does not include bear.

SOURCE: Table by ADF&G from KANA 1983 data

The basic pattern of contribution of different species and species groups to household diets is similar for most rural communities. The three resources of salmon, deer, and marine mammals together make up over two-thirds (68.1%) of total mean rural food weights. The contribution of these three resource groups varies from a high of 84 percent of total food weights in Karluk to a low of 49 percent in Port Lions.

Salmon make the greatest contribution in all communities except Port Lions where halibut and salmon are nearly equal. For all rural communities, salmon comprises 696 of the total household average of 1,611 pounds of harvested fish and game or 43.2 percent. At the community level, the range is from a high of 2223 pounds of salmon taken per household in Karluk (67.4%) to a low of 287 in Port Lions (33.2%).

Marine mammals are next in overall contribution with a mean of 216 pounds per household or 13.4 percent of the total harvested rate. Variation among rural communities in marine mammals contribution to diet is greater than for any other resource. In absolute and relative terms, marine mammals make the largest contribution to Akhiok households with 547.9 pounds comprising 27.7 percent of the total. At the other extreme is Port Lions where households only reported taking a mean of 24.7 pounds or 2.8 percent of the total weight of their harvests. In Akhiok, Karluk, and Old Harbor, marine mammals were second after salmon as a percentage of total harvested food weight.

Deer comprise the third most important resource. The mean contribution to all rural households is 185 pounds representing 11.5 percent of total harvest weight. The absolute and relative range of deer harvests and contributions to total is narrow. Highest absolute harvests were reported by Larsen Bay households with 251 pounds and the lowest absolute harvest came from Ouzinkie with 111 pounds. In relative terms, the range is from a high of 15.1 percent in Larsen Bay to a low of 7.1 percent in Karluk. Karluk's low percentage occurs despite a mean of 235 pounds per household due to the overwhelming predominance of salmon in harvest figures. For Larsen Bay, deer are the second most important resource while for all other communities they are third in importance.

Table 71 presents data on fish and game food weights for Kodiak road-connected populations. The mean food weight for the entire road-connected sample was 460 pounds. The highest figure was reported for the Chiniak sample with a total household mean of 793.6 pounds while the lowest was reported by the Filipino sample at 386.6 pounds. The pattern of species mix among residents of the Kodiak road-connected area differs in several important ways from that of the rural communities. The three most important species groups to road-connected populations are, in order of importance, non-salmon fish (primarily halibut), salmon and deer. These three combined contribute almost 83 percent of the total mean household food weight from fish and game resources among residents of the road-connected area.

Non-salmon fish contribute an average of 197.5 pounds to households of populations in the road-connected areas for an overall relative contribution of 42.9 percent. The relative contribution of non-salmon fish to harvest food weights extends from a low of 19 percent among the Kodiak city

TABLE 71

MEAN FOOD WEIGHT OF FISH AND GAME HARVEST PER HOUSEHOLD, PER CAPITA FOOD WEIGHT, KODIAK ROAD-CONNECTED AREA, 1982-1983[1,2,3]

KODIAK ROAD-CONNECTED AREA

	General Sample	Coast Guard	Chiniak	Filipino	Native
No. Households Surveyed	155	76	17	34	35
All Salmon	132.0	64.5	264.7	113.1	181.5
All Fish	331.6	326.4	465.1	280.0	258.3
All Crab	26.0	34.0	49.4	5.3	12.5
All Invertebrate	54.7	54.2	96.7	52.2	55.0
Deer	57.7	24.3	190.6	41.9	65.4
Marine Mammals	9.7	0.0	17.1	0.0	1.3
Small Game	5.1	4.4	17.1	5.8	17.6
All Game	82.8	29.6	232.1	54.3	90.8
All Species	475.2	412.7	793.9	386.6	404.2
Mean Household Size (persons)	3.32	2.41	3.94	4.18	3.49
Per Capita Food Weight of Harvest	143.1	172.0	203.6	92.0	115.5

1. Food weight given in pounds, converted from harvest number using standard conversion factors, see Table 21.
2. Data are for a 12 month period, most often from June 1982 through May 1983. See methodology section for details.
3. Because of rounding and the computer techniques used to deal with missing data, the column, row, and category totals may not always equal 100% or the totals expected from the addition of constituent numbers.

Source: Data from KANA 1983 survey; table prepared by Subsistence Division, Alaska Department of Fish and Game.

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Native sample to a high of 63.5 percent among the Coast Guard. Although salmon are second in importance to non-salmon fish among the road-connected population, they still contribute a mean 126.4 pounds to household fish and game food weight. This represents 27.5 percent of the total mean road-connected harvest weight.

The relative position of deer in road-connected and rural patterns of fish and game food eight harvests is similar. Deer contribute a mean of 56 pounds to the road-connected household subsistence food weight. This provides a relative contribution of 12.2 percent.

Contribution of Marine and Terrestrial Resources to Mean Total Harvests of Fish and Game

The relative contribution of marine and terrestrial resources to mean total household harvest weights was obtained by adding different resources together. The marine resource contribution was computed by combining the figures for all fish, all invertebrates (including crab), and all marine mammals. Note that this grouping includes salmon, dolly varden, and steelhead as marine resources, which is appropriate given the importance of the marine environment to salmon and steelhead. Table 72 presents food weight harvests organized by marine and terrestrial resource groupings for rural communities and road-connected areas.

TABLE 72

CONTRIBUTION OF MARINE AND TERRESTRIAL RESOURCES TO
MEAN FISH AND GAME FOOD WEIGHTS OF
KODIAK ROAD-CONNECTED AND RURAL HOUSEHOLDS

Type of Resource	Road-Connected Areas		Rural Communities	
	Mean Harvest Weight (lbs.) By Household	Percent	Mean Harvest Weight (lbs.) By Household	Percent
Marine[1]	386.3	84%	1343	83.4%
Terrestrial	73.7	16%	268	16.6%
Total	460	100%	1611	100%

1 Includes all fish, all invertebrates, and marine mammals.

SOURCE: KANA 1983 Survey data

Cultural Dynamics 1986

Among residents of road-connected areas, marine resources accounted for an average of 386.3 pounds or 84 percent of the average household fish and game food weight. The range of absolute values was from a high of 579 pounds among the Chiniak sample to a low of 315 pounds among the Kodiak city Native sample. The relative contribution of marine resources to fish and game food weights ranged from a high of 92 percent in the Coast Guard sample to a low of 77.8 percent in the Kodiak city Native sample.

In the rural communities, marine resources provide an overall mean of 1343 pounds or 83.4 percent of household total harvests. All communities obtain more than 80 percent of their fish and game harvests from marine resources. Karluk has the highest absolute figure at 2919 pounds of marine resources as well as the highest relative figure with 88.5 percent of subsistence food weight deriving from marine resources. The lowest absolute total marine harvests were in Port Lions with an average of 724 pounds per household while Ouzinkie was the lowest relative figure at 80.5 percent.

Extrapolated Regional Harvests

Tables 73 and 74 provide estimates of total regional harvests of fish and animal resources extrapolated using survey data and the most recent census data available from the Kodiak Borough. An estimated 2.5 million pounds of fish and game resources were harvested with fish about 1.7 million pounds, game about 500,000 pounds, and marine invertebrates about 260,000 pounds. Approximately 182,000 salmon; 21,000 halibut; 68,400 crab; 6,600 deer; and 14,900 ducks were taken in the 12 months covered by the survey.

Chignik Area Subsistence Division Survey Harvest Data

In 1982 and 1983, Subsistence Division personnel conducted household surveys in all five Chignik area communities on subsistence harvest, use, distribution and exchange. When this report was being prepared, they had not completed the analysis of those data, so unpublished harvest data from all five Chignik communities was obtained from the Subsistence Division by special request (Morris 1985). The number of households interviewed in each community along with the mean household size also were provided. It should be noted that these harvest figures are for a single annual cycle only and therefore may not necessarily reflect a typical subsistence pattern since fluctuations often occur in subsistence harvest levels from year to year as a result of environmental and other factors.

The per capita subsistence harvests from the five Chignik area communities are presented in Table 75. Data are collapsed into five categories. "Fish" include freshwater, marine, and anadromous varieties. "Land mammals" include species such as moose, caribou, bear, hare, beaver, and porcupine. "Marine mammals" consists of seal, walrus, and whale. "Other" contains birds, marine invertebrates, and certain plant products.

The most important resource type in the Chignik communities as in Kodiak is fish; although not further broken out into species, it is a safe assumption that salmon represent the majority of the fish used in the Chignik communities. They represent a clear and substantial majority of the subsistence harvests in four of the five Chignik communities. For all communities, fish represent 57.6 percent of subsistence harvests. The second most important category of subsistence harvests are land mammals;

TABLE 73

ESTIMATED TOTAL HARVEST OF SELECTED SPECIES, KODIAK ROAD-CONNECTED AND RURAL AREAS, 1982-1983[1,2,3,4,5]

	KODIAK ROAD-CONNECTED AREA			RURAL		TOTAL
	City Area	Coast Guard	Chiniak Pasagshak	Rural No. Community[6]	Six Rural Communities	
Population[7]	8,247	1,995	611	597	1,264	12,714
Salmon:						
Red	29,063	2,566	2,173	9,821	20,764	64,387
King	745	166	297	411	870	2,489
Silver	23,350	3,560	3,657	6,679	14,121	51,367
Pink	17,636	6,126	1,391	8,061	17,042	50,256
Chum	2,981	745	672	2,928	6,191	13,517
TOTAL SALMON	73,775	13,162	8,190	27,900	58,988	182,016
Halibut	12,172	5,629	688	905	1,913	21,307
Dolly Varden	21,114	11,920	797	2,533	5,356	41,720
Steelhead	1,490	2,318	219	543	1,148	5,718
Butter Clams	3,974	828	656	823	1,739	8,020
Crab:						
King	17,885	8,775	2,704	2,303	4,869	36,536
Tanner	10,930	3,891	641	609	1,287	17,358
Dungeness	7,949	2,649	703	1,036	2,191	14,528
Deer	3,229	497	688	707	1,496	6,617
Rabbit	2,981	1,324	531	345	730	5,931
Ptarmigan	1,739	497	63	345	730	3,374
Ducks	1,987	166	563	3,915	8,278	14,909
Geese	0	83	31	329	696	1,139
Harbor Seal	248	0	16	230	487	981
Sea Lion	0	0	16	132	278	426

1. Harvest in numbers except clams which are in 5 gal. buckets.
2. Kodiak Road-Connected data are from a sample of all road connected areas.
3. Rural community data combine data from 6 rural communities, total population was surveyed.
4. Data are for a 12 month period, most often from June 1982 through May 1983. See methodology section for details
5. Because of rounding and the computer techniques used to deal with missing data, the column, row, and category totals may not always equal 100% or the totals expected from the addition of constituent numbers.
6. Persons living rurally outside communities were not surveyed. In this computation the assumptions are made that family size and fish and game harvest for this population are the same as for rural community residents.
7. Population data are from Kodiak City and Borough census, 1982, supplied by Linda Fried.

TABLE 74

ESTIMATED FOOD WEIGHT OF TOTAL FISH AND GAME HARVEST, KODIAK ROAD-CONNECTED AND RURAL AREAS, 1982-1983[1,2,3,4,5]

	KODIAK ROAD-CONNECTED AREA			RURAL		TOTAL
	City Area	Coast Guard	Chiniak Pasagshak	Rural No Community[6]	Six Rural Communities	
Population[7]	8,247	1,995	611	597	1,264	12,714
All Salmon	327,893	53,393	41,373	122,980	260,015	805,654
All Fish	823,706	270,194	72,695	163,052	344,739	1,674,386
All Crab	64,585	28,145	7,721	6,991	14,782	122,224
All Invertebrates	135,877	44,867	15,114	22,323	47,196	265,377
Deer	143,329	20,116	29,790	30,465	64,413	288,113
Marine Mammals	24,095	0	2,672	35,548	75,160	137,475
Small Game	12,669	3,642	2,672	12,321	26,050	57,354
All Game	205,678	24,503	36,277	77,512	163,883	507,853
All Species	1,180,414	341,633	124,086	259,482	548,620	2,454,235

1. Food weight given in pounds, converted from harvest number using standard conversion factors.
2. Kodiak Road-Connected data are from samples of all road connected areas.
3. Rural community data combine data from 6 rural communities, total population was surveyed.
4. Data are for a 12 month period, most often from June 1982 through May 1983. See methodology section for details.
5. Because of rounding and the computer techniques used to deal with missing data, the column, row, and category totals may not always equal 100% or the totals expected from the addition of constituent numbers.
6. Persons living rurally outside communities were not surveyed. In this computation the assumptions are made that family size and fish and game harvest for this population are the same as for rural community residents.
7. Population data are from Kodiak City and Borough census, 1982, supplied by Linda Fried.

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TABLE 75

SUBSISTENCE HARVESTS FOR CHIGNIK AREA COMMUNITIES*
(Pounds)

	Resource Category					
Community	Fish	Marine Mammals	Land Mammals	Other	Total Capita	Total Hhold
Chignik	167	5	14	10	196	843
Chignik Lagoon	145	3	59	22	229	779
Chignik Lake	162	3	366	8	539	2695
Ivanof Bay	290	21	96	38	445	1646
Perryville	276	1	85	17	396	1703
Average	208	10	124	19	361	1535

* Number of households in sample and mean household size

	Households	Mean Size
Chignik	19	4.3
Chignik Lagoon	19	3.4
Chignik Lake	23	5.0
Ivanof Bay	6	3.7
Perryville	20	4.3
Total/Average	87	4.2

SOURCE: Morris 1985

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the most important species in this category are likely moose and caribou. For the village of Chignik Lake, land mammals are the most important resource category comprising 67.9 percent of subsistence harvests. For all five communities land mammals represent 34.3 percent of subsistence harvests. The "other" category represent a little over 5 percent of subsistence harvests while marine mammals comprise an even smaller 2.8 percent of the average harvest for all Chignik communities.

There are substantial differences in the size and composition of subsistence harvests among the Chignik communities. The per capita harvest ranges from a low of 196 pounds in Chignik to a high of 539 in Chignik Lake. There appear to be two clusters of subsistence harvest level: one around 200 pounds per capita comprised of Chignik and Chignik Lagoon and another around 450 pounds comprised of Chignik Lake, Ivanof Bay and Perryville.

The composition of the subsistence harvests does not differ greatly between the communities or the clusters of communities. Fish and land mammals are generally first and second in importance, together comprising over 90 percent of subsistence harvests. Marine mammals and other are minor contributors. There are two noteworthy exceptions to this general pattern. First, land mammals are by far the most important resource used by Chignik Lake residents. Second, marine mammals make a significantly higher contribution to the subsistence harvest of Ivanof Bay and Perryville residents than they do to any of the other three communities in the Chignik area.

DISTRIBUTION AND EXCHANGE OF FISH AND GAME HARVESTS

Subsistence resources are often dispensed from the producing household(s) to other households for a variety of reasons. Resources may then also be further disbursed by the receiving household to other households. A distinction can be drawn between transfers of subsistence resources which can be defined as distribution and others which can be defined as exchange (Langdon and Worl 1981). Distribution refers to the transfer of resources without expectation of return of value, equal or unequal. Reasons for distribution include social obligations such as kinship obligations; generalized reciprocity; provision for the needy, infirm, or elderly; friendship; prestige attainment; and surplus. Exchange refers to transfers in which a measured equivalence is expected in return for resources given. This type of transaction in a subsistence economic system is most commonly termed barter. The most common reason for exchange is to obtain needed or desired resources unavailable to both parties through their own productive efforts. Through both of these mechanisms Kodiak and Chignik area residents disburse fish and game resources from harvesting households to other households in the same community in which the producers live, to households in other communities in their respective area, and to households outside their areas.

Two types of data from the KANA survey contribute to an understanding of distribution and exchange in the Kodiak area. The KANA survey reports data on household use of resources in addition to harvests. Analysis of this data provides an indication of what resources and what quantities are being transferred from producing households to other households when mean household use is above mean household harvest. However, when mean household harvest exceeds use, the data might also be an indication of the proportion of household harvests that are not consumed. It is likely that insurance margins of certain species are regularly taken in order to protect against potential shortages in other resources. The fact that most resources are only available for short periods during the year would also contribute to the practice of taking insurance harvests. In addition, the KANA survey presents data on the distribution of harvested foods between households, which is also discussed below.

Use Data

Tables 76-79 provide a parallel to Tables 68-71 by presenting use figures first by mean number of a given species used by a household and second by converting those numbers into food weights. In this section, a summary of important differences between harvest and use tables is presented. A single discussion of numbers and food weight is provided.

TABLE 76

MEAN HOUSEHOLD USE OF SELECTED RESOURCES IN NUMBERS, KODIAK RURAL COMMUNITIES, 1982-1983[1,2,3]

Species	Akhiok	Karluk	Larsen Bay	Old Harbor	Ouzinkie	Port Lions
Salmon:						
Red	62.1	250.3	66.1	7.9	38.8	19.3
King	0.0	14.1	3.1	1.3	1.0	.7
Silver	23.6	42.4	22.6	56.0	26.2	16.1
Pink	60.2	39.6	44.6	75.4	22.0	6.1
Chum	11.2	1.6	4.8	39.3	15.7	1.2
TOTAL SALMON	157.1	348.0	141.2	179.9	103.7	43.4
Halibut	1.6	4.9	8.7	6.4	3.4	7.5
Dolly Varden	9.4	25.7	17.3	7.8	21.8	5.2
Steelhead	0.0	9.4	11.5	1.1	6.3	.9
Butter Clams[1]	3.8	2.7	7.7	4.5	4.2	3.1
Crab:						
King	17.5	7.5	12.6	9.0	12.1	19.2
Tanner	2.7	4.9	7.0	4.0	5.0	7.4
Dungeness	1.0	5.6	9.8	4.9	7.4	7.7
Deer	3.2	4.2	5.5	4.7	3.2	2.4
Rabbit	.5	1.6	1.8	1.6	4.8	2.7
Ptarmigan	5.5	8.6	1.8	1.2	.2	.2
Ducks	30.7	37.9	18.8	19.1	37.8	12.0
Geese	9.2	.4	.1	1.9	4.5	0.0
Harbor Seal[1]	74.2	67.3	36.3	54.5	29.8	4.1
Sea Lion[1]	67.4	20.3	108.0	102.4	8.4	0.0

1. Harvest in numbers except clams which are in 5 gal. buckets, and seal and sea lion which are in pounds
2. Data are for a 12 month period, most often from June 1982 through May 1983. See methodology section for details.
3. Because of rounding and the computer techniques used to deal with missing data, the column, row, and category totals may not always equal 100% or the totals expected from the addition of constituent numbers.

Source: Data from KANA 1983 survey; table prepared by Subsistence Division, Alaska Department of Fish and Game.

TABLE 77

MEAN HOUSEHOLD USE OF SELECTED RESOURCES IN NUMBERS, KODIAK ROAD-CONNECTED AREA, 1982-1983[1,2,3,4]

KODIAK ROAD-CONNECTED AREA

	General Sample	Coast Guard	Chiniak	Filipino	Native
No. Households Surveyed	155	76	17	34	35
Salmon:					
Red	13.1	3.2	14.0	12.9	21.9
King	.8	.2	1.9	.5	.9
Silver	9.1	4.1	21.9	10.5	12.4
Pink	4.3	5.8	7.7	3.0	10.4
Chum	1.0	.8	4.4	.7	1.4
TOTAL SALMON	28.3	14.1	49.9	27.6	47.0
Halibut	6.3	4.8	4.9	3.5	8.6
Dolly Varden	7.7	13.7	5.1	20.0	6.2
Steelhead	.8	2.6	1.4	2.3	3.3
Butter Clams[1]	1.6	1.0	4.1	3.1	3.9
Crab:					
King	12.0	9.8	18.9	9.3	12.1
Tanner	7.0	4.8	4.9	12.4	3.7
Dungeness	6.5	3.2	5.4	23.4	6.1
Deer	1.8		2.8	1.1	1.9
Rabbit	1.7	1.5	4.0	1.2	5.7
Ptarmigan	.7	.6	.5	1.1	2.0
Ducks	.9	.2	6.0	1.4	4.0
Geese	0.0	.1	.3	0.0	2.1
Harbor Seal[1]	6.8	0.0	2.7	0.0	0.0
Sea Lion[1]	9.8	0.0	0.0	0.0	0.0

1. Harvest in numbers except clams which are in 5 gal. buckets and seal and sea lion which are in pounds.
2. Kodiak City data is from a sample of all road connected areas excluding Chiniak and Pasagshak.
3. Data are for a 12 month period, most often from June 1982 through May 1983. See methodology section for details.
4. Because of rounding and the computer techniques used to deal with missing data, the column, row, and category totals may not always equal 100% or the totals expected from the addition of constituent numbers.

Source: Data from KANA 1983 survey; table prepared by Subsistence Division, Alaska Department of Fish and Game.

TABLE 78

MEAN FOOD WEIGHT OF FISH AND GAME USED BY RESOURCE CATEGORY, KODIAK RURAL COMMUNITIES, 1982-1983[1,2,3]

	Akhiok	Karluk	Larsen Bay	Old Harbor	Ouzinkie	Port Lions
No. Households Surveyed	21	20	32	76	32	55
All Salmon	621.9	1592.9	594.7	791.9	472.3	205.1
All Fish	690.3	1864.2	990.1	1045.3	668.0	485.4
All Crab	45.3	28.9	47.0	30.4	41.1	61.4
All Invertebrate	168.4	90.6	176.5	126.1	146.5	114.7
Deer	137.8	181.5	239.6	201.4	136.3	104.1
Marine Mammals	141.6	67.3	144.7	156.8	38.3	4.1
Small Game	127.5	106.0	52.4	61.5	126.5	35.7
All Game	407.0	389.0	442.7	427.6	322.7	153.0
All Species	1265.6	2343.8	1523.7	1598.2	1137.2	753.6
Mean Household Size (persons)	3.81	3.95	4.16	3.79	3.34	3.30
Per Capita Food Weight Used	360.5	593.4	371.1	421.7	340.5	228.4

1. Food weight given in pounds, converted from use number using standard conversion factors.
2. Data are for a 12 month period, most often from June 1982 through May 1983. See methodology section for details.
3. Because of rounding and the computer techniques used to deal with missing data, the column, row, and category totals may not always equal 100% or the totals expected from the addition of constituent numbers.

Source: Data from KANA 1983 survey, table prepared by Subsistence Division, Alaska Department of Fish and Game.

TABLE 79

MEAN FOOD WEIGHT OF FISH AND GAME USED BY RESOURCE CATEGORY, KODIAK ROAD-CONNECTED AREA, 1982-1983[1,2,3]

KODIAK ROAD-CONNECTED AREA

	General Sample[4]	Coast Guard	Chiniak	Filipino	Native
No. Households Surveyed	155	76	17	34	35
All Salmon	134.4	59.3	254.5	132.0	210.5
All Fish	386.9	250.8	471.3	337.8	541.2
All Crab	43.3	32.3	55.0	57.5	38.1
All Invertebrates	88.2	50.8	107.7	128.0	107.2
Deer	79.1	25.6	122.5	47.1	81.2
Marine Mammals	16.5	0.0	2.7	0.0	1.0
Small Game	6.3	4.2	24.8	6.7	33.1
All Game	114.9	31.7	155.4	61.1	128.3
All Species	588.7	334.8	734.4	526.9	776.7
Mean Household Size (perons)	3.32	2.41	3.94	4.18	3.49
Per Capita Food Weight Used	177.4	138.9	186.4	126.1	222.6

1. Food weight given in pounds, converted from use numbers using standard conversion factors
4. General Sample data are from a random sample of all road connected areas including Kodiak City, Service Area One, Bells Flats, Women's Bay, and Monashka Bay, but excluding Chiniak and Pasagshak.
2. Data are for a 12 month perioa, most often from June 1982 through May 1983. See methodology section for details.
3. Because of rounding and the computer techniques used to deal with missing data, the column, row, and category totals may not always equal 100% or the totals expected from the addition of constituent numbers.

Source: Data from KANA 1983 survey; table prepared by Subsistence Division, Alaska Department of Fish and Game.

A comparison of total mean pounds harvested with total mean pounds used for road-connected populations reveals that three of the five sample groups consume more than they produce. The disparity is greatest for the Native households who consume nearly twice what they produce. The Filipino and general sample households also consume significantly greater amounts than they produce. On the other side of the ledger are the Coast Guard and Chiniak populations who consume less than they produce. The disparity is greater for the Coast Guard than for Chiniak. One should not infer from this breakout that the Coast Guard and Chiniak households are distributing or exchanging their surplus harvests to the other three groups. Sources of additional consumed resources in households not producing what they use are likely many and varied.

The Kodiak road-connected populations generally break into two distinct groupings. This is evident when salmon harvest and use data are compared. The general sample, Coast Guard, and Chiniak groups all display mean household use figures within 5 percent of harvest figures. Generally use figures are slightly below harvest figures which likely suggests some left-over harvest and little distribution or exchange of salmon by households in these three groupings. The one exception to this pattern among these three groups is that the general sample uses slightly more salmon than it harvests. A quite different pattern is displayed by the Filipino and Native road-connected sample populations. In both of these groups, use of salmon is more than greater than that harvested. This is a clear indication that these households are receiving through distribution or exchange a significant portion of the salmon they consume.

Halibut use follows a similar pattern to that of salmon with the exception of the Kodiak road-connected general sample households which consume over 25 percent more halibut than they produce. The Coast Guard sample households consume considerably less than they harvest, while the Chiniak sample is closest to the salmon pattern with slightly less consumption than production. Both the Filipino and Native samples again use substantially more than they produce. The road-connected Native sample consumption of halibut is an incredible 437 percent greater than production indicating receipt of substantial quantities of halibut through distribution or exchange networks. Net receipts of other fish and clams are evident only for road-connected Native households; all other groups either use slightly smaller or exactly the same amounts as they report harvesting.

Crab use figures show substantial deviation from harvest figures for almost all groups. The Coast Guard is the only group for which mean household food weight of crab used is lower than harvested. General sample households use 66.5 percent more than they harvest while Chiniak sample households use 11.3 percent more than they harvest. Once again Filipino and Native households are most extreme in the deviation between use and harvest with the former households consuming 985 percent more crab than they produce and the latter consume 205 percent more crab than they harvest. It is possible that Native consumption levels could be supported through distribution and exchange networks; however, these mechanisms cannot account for the extraordinary amounts of crab which Filipino households use. Given the strong presence of the Filipino population in the seafood processing sector, it is possible that they obtain crab from fishermen or their plants.

For deer, four of the five road-connected populations use more than they harvest. Consumption levels are slightly above harvest levels for the Coast Guard and Filipino populations. The general sample and the Native sample show moderately higher levels of use over harvesting. The Chiniak sample households differ sharply from their neighbors in that they appear to be distributors rather than receivers of deer. Chiniak households harvest a mean of 190.6 pounds of deer while only using a mean of 122.5 pounds.

Rabbit, ptarmigan, and waterfowl are unexceptional in their patterns of harvest and use by different populations. The general sample, Coast Guard, and Chiniak populations all use very close to what they report harvesting. The Filipino and Native populations use more than they harvest indicating that they are recipients from others.

One note of interest in the marine mammal use data is the surprising use of 16.5 pounds of sea lion and harbor by general sample households. These same households reported a mean of 9.7 pounds harvested.

In the rural Kodiak communities, patterns of harvest and use are somewhat different than found in the road-connected populations. In all six villages, mean harvest poundage exceeds mean use poundage, but by different amounts. The greatest discrepancy is found in Akhiok and Karluk, where households harvested between 25 and 35 percent more food weight than they consumed. In Old Harbor and Port Lions, between 10 and 15 percent more food weight was harvested than consumed by households. The least discrepancy was found in Larsen Bay and Ouzinkie whose excess of production over consumption was between 5 and 10 percent. These patterns of additional production are likely the result of insurance harvests combined with distribution to kinsmen and others in Kodiak city, other parts of Alaska, and even outside of Alaska.

On a species basis the greatest discrepancies between harvest and use are for salmon. This is one of the species groups which accounts for the substantial disparities found in Akhiok and Karluk between production and use. Akhiok households harvest an additional 200 pounds of salmon over what the household consumes while the figure is in excess of 600 pounds for Karluk households. In Larsen Bay, Ouzinkie, and Port Lions, the range of salmon pounds harvested in excess of household consumption is 50-80 pounds. Old Harbor households consume virtually actually the amount of salmon they produce.

For halibut, no clear pattern of relationship between production and use is apparent. Akhiok and Port Lions harvest more than they use. Larsen Bay, Old Harbor, and Ouzinkie use more than they harvest. Karluk uses exactly what they harvest. Dolly varden, steelhead, and clams all exhibit a pattern in which, for virtually all communities, harvest levels slightly exceed use figures. In Ouzinkie and Akhiok, crab use is almost exactly the same as harvest. In the other four communities, however, crab use exceeds harvest by a moderate amount indicating some additional, unknown source of supply.

Deer provide a fairly clear pattern of relationship in which harvests slightly exceed use. Akhiok, Karluk, Larsen Bay, Port Lions and Old Harbor households use less than deer than they harvest. In all cases, consumption is less than 25 percent lower than harvest. Only in Ouzinkie is deer use higher than harvests, again by less than 25 percent. For small game (rabbit, ptarmigin) use is virtually the same as harvests for Akhiok, Karluk, Larsen Bay, and Old Harbor. In Ouzinkie and Port Lions, slightly higher use over harvest levels is reported. A similar pattern is also apparent for ducks and geese.

Marine mammals are the second source of the overall rural pattern of harvest levels being higher than use levels. In all of the six rural communities marine mammal harvests exceed use levels. Larsen Bay households come the closest to using what they harvest, consuming approximately two-thirds of the marine mammal food weight. In the other communities, harvests exceed use by several hundred percent.

A note should be made about the use of marine mammals. Selected parts of marine mammals, (liver, flippers) are considered delicacies in many Native households and the animal fat is rendered into oil for consumption with a wide variety of foods. The meat of harbor seal and sea lion is itself consumed by few households, certainly in substantially smaller quantities than are harvested to obtain the delicacy parts. This pattern of selected part use accounts for the difference between marine mammal harvests and use.

Distribution Data

The KANA survey collected data from households on patterns of distribution and receipt of different fish and game resources from different sources, i.e. from the same community in which they live and from other communities. The data is useful in identifying the flow of fish and game resources both within and between communities and is thus an indicator of linkages between communities. Data was collected in each of the six rural communities but only for the general sample and the Kodiak Native sample in the road-connected areas. Resources distributed and received were reported in the following categories: game, fish/shellfish, ducks/birds, and plants/berries. A brief characterization of the patterns identified for each of the six rural communities and the two road-connected populations follows.

The community of Akhiok is relatively isolated and self-contained in terms of resource distribution linkages to other communities. Distribution among households in the village, however, is high. Over 75 percent of surveyed households reported receiving game, fish/shellfish, and ducks/birds from other Akhiok households. About 10 percent distribute fish and game resources to all other Akhiok households. The village appears to have linkages only with Kodiak city, but with very few households in the regional center. About 15 percent of Akhiok households report distributing game and fish/shellfish to Kodiak households while 20 percent distributed ducks/birds.

Karluk displays an extensive pattern of community distribution and receipt of fish and game resources. Within the community, 85 percent of the households distribute game and fish/shellfish to a mean of 4.7 other households. Outside the village, they distribute resources primarily to Larsen Bay and Kodiak households. Seventy percent of Karluk households send fish/shellfish to a mean of 3.1 households in Larsen Bay while 45 percent send game to a mean of 1.3 households in that community. Eighty-five percent distribute fish/shellfish to a mean of 3.7 households in Kodiak city, and 60 percent send game to a mean of 1.4 households in Kodiak city. Lower numbers of households in Karluk distribute game, fish/shellfish, and ducks/birds to fewer households outside the Kodiak archipelago. A few (5-10%) Karluk households also send game and fish/shellfish to a small number of households in Ouzinkie. Ninety-five percent of Karluk households reported receiving fish/shellfish from over three other households and 90 percent reported receiving game from other Karluk households. Larsen Bay was the source of game for 65 percent of Karluk households and fish/shellfish for 85 percent. About two Karluk households received resources in these categories from Larsen Bay donors. A very small proportion of Karluk households reported receiving game and fish/shellfish from Kodiak and points outside the Kodiak archipelago.

Larsen Bay exhibits a strongly symmetrical pattern of distribution with Karluk although Karluk appears to be more donor than recipient. A notable difference between the two is that Larsen Bay exhibits a very high distributive relationship with Kodiak city. Internal distribution among Larsen Bay households is somewhat lower than the high rates shown in Akhiok and Karluk; however those who do distribute in Larsen Bay, distribute to a similar number of households as do Karluk and Akhiok residents. Two-thirds of Larsen Bay households reported distributing fish/shellfish and the mean number of households to which those resources were given was 3.9. For game, 53 percent of Larsen Bay households reported distributing game with 1.9 households reported as the mean number of recipients. As usual lower rates and averages are reported for ducks/birds and plants/berries. Distribution by Larsen Bay households outside the community is the highest as over 40 percent of Larsen Bay households reported distributing game and fish/shellfish to households in Kodiak. Over 20 percent of Larsen Bay household reported distributions of game and fish/shellfish to households in communities outside the Kodiak region. The KANA survey does not indicate where those households were located. In terms of receiving resources, 97 percent of Larsen Bay households reported receiving from other households in the community. The mean number of households from which fish/shellfish came was 3.4. Two-thirds of Larsen Bay households reported receiving game from others; the mean number of households from which game came was 2.0. The only external sources of significance were Karluk households; 63 percent of Larsen Bay households reported receiving fish/shellfish from there. Small numbers of households received resources from Kodiak, Old Harbor, and locations outside the Kodiak region.

Old Harbor displays a relatively high degree of self-sufficiency and an intermediate level of linkage among households in the community. About 70 percent of Old Harbor households distribute fish/shellfish to other households within the community; the mean number of households to whom fish/shellfish were given was 2.1. Slightly fewer (62%) of Old Harbor households distributed game to others in the community with a mean of 1.8

household recipients. Minimal distributions (less than 10% of Old Harbor households) were made to Kodiak city, Akhiok, Karluk, and locations outside the Kodiak region. The pattern of Old Harbor household receipt of resources is symmetrical with the pattern of giving. Two-thirds of households reported receiving fish/shellfish from others in the community and 64 percent reported receiving game from others. The mean number of households from which fish/shellfish came was 1.9 while the same figure for game was 1.4. Ducks/birds were received by over 50 percent of the households from others in the community. Minimal amounts of wildlife were received by Old Harbor residents from Akhiok, Kodiak, and points outside the region.

Ouzinkie exhibits an intermediate pattern of intracommunity distribution and an intermediate pattern of intercommunity giving and receiving. Within the community, almost 80 percent of households distributed fish/shellfish, and over 50 percent distributed game and ducks/birds to at least one other household. Even plants and berries were distributed by 41 percent of Ouzinkie households. Fish/shellfish were the most widely distributed with a mean of 4.1 households being given this resource. Ducks/birds were second at 1.7 while 1.6 households were given game. Ouzinkie households distributed food primarily to Kodiak city households with 28 percent giving fish/shellfish, 19 percent game, and 16 percent ducks/birds. Distributions to locations outside the Kodiak region were also high with 25 percent of the households giving fish/shellfish, 16 percent game, and 13 percent ducks/birds. Port Lions was the only rural village to which Ouzinkie households sent harvested foods, but these levels were much lower than for Kodiak city or locations outside the region. The pattern of receipt of harvested foods in Ouzinkie indicates stronger ties within the community than does the giving data. Over 80 percent of Ouzinkie households reported receiving fish/shellfish, game, and ducks/birds from another Ouzinkie household. Receipts of resources from locations to which Ouzinkie households sent harvested foods were considerably lower as less than half as many households reported receiving foods than giving foods from Kodiak city sources or sources outside the region. Households receiving resources from Port Lions, however, outnumbered households giving to Port Lions households by about 2 to 1.

The pattern of giving and receiving harvested foods exhibited by Port Lions is similar to that of Ouzinkie, although weaker, and has more linkages with other Kodiak rural communities. Seventy percent of Port Lions households distributed fish/shellfish to households in the community, with a mean of 3.0 households to whom these resources were given. Less than 50 percent, however, distributed game or ducks/birds to other households in the community. Like Ouzinkie, households in Kodiak city and locations outside the region, in that order, were the greatest beneficiaries of Port Lions' distribution of harvested foods. Ouzinkie was the major rural community receiving these with 19 percent of Port Lions households reporting giving fish/shellfish to households in Ouzinkie. Unlike Ouzinkie, however, small amounts of game, fish/shellfish, and plants/berries were also sent from Port Lions to households in Old Harbor and Larsen Bay. The pattern of receiving harvested foods by Port Lions is similar to Ouzinkie's and Port Lions' own distribution pattern. Within the community, over 80 percent of households reported receiving fish/shellfish from other households while less than 50 percent reported receiving game or ducks/birds from other households. Smaller quantities of resources were received from Kodiak city and locations outside the region than were given, less was received from Ouzinkie than was given, but greater quantities were received from Old Harbor and Karluk than were sent to those communities.

As noted previously, KANA survey data on giving and receiving of harvested foods by populations in the road-connected area included information only from the general sample and the Kodiak city Native sample. Data for the Kodiak city general sample indicate a weaker pattern of distribution to other households within the community and within the region than found for the rural communities; with distribution to households outside the region intermediate between rural communities that reported virtually no extraregional distribution (Akhiok, Old Harbor) and the others reported that either moderate or strong distribution outside the region (Karluk, Larsen Bay, Ouzinkie, Port Lions). Extraregional distribution by the Kodiak general sample is noteworthy only for fish/shellfish which 22 percent of the households reported sending outside the region. Distribution is highest to other households in Kodiak city--62 percent of the sample reported giving fish/shellfish to other households; 2.2 households was the mean to whom these resources were given. Less than 30 percent of general sample households reported distributing any other resources to other households in Kodiak city. Minimal distribution was reported to Port Lions, with trace distributions to Old Harbor, Ouzinkie, and Larsen Bay and no distribution to Akhiok or Karluk.

As might be expected from the previous discussion of distribution patterns of the villages, Kodiak city general sample households are the recipients of all categories of resources from all rural communities in the region. However, general sample households reported much lower receipts of harvested resources from locations outside the region than they reported giving. Despite the receipt of harvested foodstuffs from all over the island, general sample households still are most strongly linked to others in Kodiak city. Eighty percent reported receiving fish/shellfish from other households in Kodiak and 47 percent reported receiving game from others in the city. Fish/shellfish are the most frequently reported received resource from Kodiak rural communities with 7 percent of the general sample reporting receiving this category from Karluk households. Akhiok is clearly the rarest source of harvested foodstuffs but similar amounts appear to come to general sample households from the other five rural communities.

The pattern of giving and receiving by the Kodiak Native sample of households is congruent with the earlier discussions of these households excess of consumption over production, of the excess of production over consumption in the rural communities, and of the distribution to Kodiak from the rural communities. Despite the linkage and dependence on resources from the rural communities, the Kodiak Native sample has greater linkages with other Kodiak city households; however those linkages are more usually through receipt than giving. Only 51 percent of Kodiak Native households report distributing fish/shellfish to a mean of 1.8 other households in the community, and only 40 percent report giving game to others in Kodiak. Distributions to households outside the region are higher than to rural communities within the region with 14 percent of Kodiak Native households indicating distribution of fish/shellfish to a mean of .3 households outside the region. There is a minimal amount of distribution of fish/shellfish, game, and ducks/birds to Port Lions, but no other rural Kodiak households were reported to be recipients of harvested foods produced by Kodiak Native households.

The pattern of receipt of foods indicates the dependence of the Kodiak Native sample on the production of harvested foods by others. Eighty percent of Kodiak Native households reported receiving fish/shellfish from a mean of 2.8 Kodiak households; 57 percent reported receiving game from a mean of 1.9 other Kodiak households. These receipt figures are higher than from any rural Kodiak community or any location outside the region. Although all rural communities contribute some resources to Kodiak Native households, the most important as measured by Kodiak Native households reported frequency of receipts (rather than pounds) are Karluk, Port Lions, and Ouzinkie. Akhiok and Old Harbor are intermediate while Larsen Bay provides relatively little to Kodiak Native households. Fish/shellfish are the most commonly received resource by Kodiak Native households from rural sources with game being second most frequently received. Unlike the pattern of receiving from rural communities, Kodiak Native households distribute more to people outside the region than they receive from them. One possible reason for the dependence of Kodiak Natives on others for harvested foods is that this population tends to be older and retired from active participation in both the cash and subsistence economies.

METHODS OF SUBSISTENCE HARVESTING

The harvesting of fish, game, and plants requires certain technologies which can vary substantially in their complexity and expense. Since the vast majority of harvesting activities do not take place within walking distance of the communities, some method of transportation must be used. If the activity is to take place on a lake or the ocean, then something from an open skiff to a 90-foot commercial fishing vessel might be used. Where roads are found, vehicles can be used to provide access to some resources. For certain resources in relatively close proximity to communities without roads, small three or four-wheelers might provide access. Private planes are owned by a few individuals in the two regions, but air travel is not a typical means of transportation for subsistence activities. The means of transportation available to a household can be a significant factor in the kinds of subsistence activities that household can undertake.

Once the harvester has been transported to the proximity of the resource, additional technologies for actually harvesting the resource are needed. These range in complexity and expense from fingers and knives for harvesting berries and greens to beach or purse seines for harvesting salmon. Salmon is a resource that can be taken through a variety of technological methods. In nearshore waters, salmon can be taken with hook and line from a boat, with drift gillnets (although this technique is not used in either the Kodiak or Chignik region), and with purse seines. In the intertidal zone, salmon can be taken with hook and line, beach seines, and set gillnets. If a beach seine is used, two skiffs will also be required. In rivers or streams, salmon can be taken with small nets, hook and line, and even by hand. In general, the farther away from the spawning grounds salmon are taken, the more expensive is the technology needed to harvest them. The predominant methods for harvesting salmon for subsistence use are hook and line, set gillnets, and beach seines.

Marine fishing for halibut, cod or other marine fish requires a boat or vessel plus a hook and line for jigging or a longline. Although crab can occasionally be taken in small number by hand or with hook and line, the most common and productive method is to use pots, either commercial or smaller pots. Pot usage requires a skiff or other vessel for deployment and retrieval. Freshwater fishing for dolly varden or steelhead is generally done with hook and line. Marine invertebrates such as clams, cockles, and chitons are harvested with shovels and by hand from intertidal waters. Marine mammal hunting is generally done from open skiffs or smaller cruiser fishing vessels. Rifles are used to dispatch the animals whether on land or in the water.

Waterfowl are taken with shotguns while ptarmigan and rabbits tend to be taken with small-caliber rifles. Waterfowl usually require use of a skiff or other vessel to hunt in areas away from the communities. Moose and caribou on the Alaska Peninsula can be hunted using high-powered rifles. Along the Pacific Coast, the shoreline and adjacent inland areas are hunted with a combination of vessel and foot travel. On the northside of the Alaska Peninsula, snowmachines and foot travel are normally used. In the Kodiak archipelago, deer can be hunted from skiff and other vessels along the coastline, particularly in the winter, and from motor vehicles along the roads. In the summer and early fall, they are hunted in the uplands on foot. Small or medium caliber rifles are usually used.

Domestic Use of Commercially Caught Species

Salmon, halibut, and crab are major subsistence resources that are also significant commercial resources. Many households headed by commercial fishermen use a small portion of the commercial take for subsistence purposes. The KANA survey collected data on the frequency of this usage for different species in the Kodiak area.

Tables 80 and 81 display percentages of households surveyed in the rural communities and the road-connected populations which make use of commercial catches of salmon, halibut, and crab. In the rural communities, domestic use of commercially caught species is highest with use of salmon being the greatest, halibut second, and crab third. In the road-connected populations, domestic use of commercial harvests is much lower than in the rural communities. In addition, crab and salmon appear as frequently in household with halibut only slightly less. The Kodiak city Native population parallels the rural pattern in that salmon appears in more households from commercial catches than either of the other two species. No data is available on the amount or frequency of domestic use of commercially caught species.

TABLE 80

DOMESTIC USE OF COMMERCIAL CATCH, BY FISHERY, KODIAK RURAL COMMUNITIES, 1982-1983[1,2]

	Akhiok	Karluk	Larson Bay	Old Harbor	Ouzinkie	Port Lions
No. Households Surveyed	21	20	32	76	32	35
Use Salmon from Commercial Harvest	81%	15%	41%	83%	63%	36%
Use Halibut from Commercial Harvest	19%	5%	25%	74%	31%	45%
Use Crab from Commercial Harvest	10%	0%	6%	47%	28%	47%

1. Data are for a 12 month period, most often from June 1982 through May 1983.

2. Because of rounding and the computer techniques used to deal with missing data, the column, row, and category totals may not always equal 100% or the totals expect from the addition of constituent numbers.

Source: Data from KANA 1983 survey; table prepared by Subsistence Division, Alaska Department of Fish and Game.

TABLE 81

DOMESTIC USE OF COMMERCIAL CATCH, BY FISHERY, KODIAK ROAD-CONNECTED COMMUNITIES, 1982-1983[1,2]

KODIAK ROAD-CONNECTED AREA

	General Sample	Coast Guard	Chiniak	Filipino	Native
No. Households Surveyed	155	76	17	34	35
Use Salmon from Commercial Harvest	18%	3%	41%	3%	34%
Use Halibut from Commercial Harvest	13%	3%	41%	6%	14%
Use Crab from Commercial Harvest	19%	4%	35%	12%	23%

1. Data are for a 12 month period, most often from June 1982 through May 1983.

2. Because of rounding and the computer techniques used to deal with missing data, the column, row, and category totals may not always equal 100% or the totals expected from the addition of constituent numbers.

Source: Data from KANA 1983 survey; table prepared by Subsistence Division, Alaska Department of Fish and Game.

LOCATIONS OF KODIAK AND CHIGNIK SUBSISTENCE HARVESTS

The Subsistence Division of the Alaska Department of Fish and Game conducted mapping studies of resource uses by residents of the six rural communities in the Kodiak region and three of the five communities (Chignik, Chignik Lagoon, Chignik Lake) in the Chignik region during 1982, 1983, and 1984. The data have been summarized cartographically on a series of maps available from the Department of Fish and Game. Descriptions of resource use areas presented below are derived from analysis of the resource use maps, from the KANA survey, and from the ADFG Southwest Regional Guide (1985b). Data on subsistence salmon use areas are taken from the 1983 Kodiak Area Finfish Management report. Patterns for the Kodiak communities will be described first and then the Chignik communities.

KODIAK

Subsistence Salmon Permit Data

Salmon subsistence harvest data derived from permit returns are presented by the location in which the salmon were reported harvested in the Annual Management Reports. Table 82 summarizes data from the most recent annual report for the 1982 season for each of the 12 sections in which subsistence salmon were taken. Sections are a unit into which the Kodiak region is divided for salmon management purposes (see Figure 1). The table indicates that subsistence salmon are allocated to 61 different harvest locations. Within each section, a mean of 5.1 harvesting locations are found. Generally speaking, these locations represent nearshore waters, estuaries, and streams in which actual harvesting took place. Communities typically use the closest sources of significant size to accommodate needs; red salmon systems may be sought out at a greater distance if none is in close proximity to the community. In ten of the twelve sections, however, there is a dominant source which provides in excess of 50 percent of the total sectional harvest, and in two-thirds of the sections, the dominant harvesting location reduced more than 65 percent of the sectional harvest. For the entire area, the 12 dominant producers accounted for 69 percent of the total harvest.

The most important section for subsistence harvests documented through permits was the Chiniak section in which Kodiak city and the majority of the road-connected population is found. This section accounted for 43.9 percent of the total permit reported subsistence fishery in 1982. Within the Chiniak section, the Buskin River is by far the most important location, accounting for 80.5 percent of sectional harvest, and also 35 percent of the total Kodiak area subsistence harvest reported through the permit process.

The second most prolific subsistence salmon producing area is the Afognak section which accounted for 25.8 percent of the total subsistence harvest. This section, with the important red salmon supporting Afognak River and Lake as its primary producer (65.8% of the sectional total), is a major

TABLE 82

PERMIT REPORTED KODIAK SALMON SUBSISTENCE HARVESTS BY SECTION, 1982

Section (Main producer)	No. of Locations	Harvest Total	% of Section Harvest	% of Total Harvest
I. Kizhuya	8	1,433		5.1%
(Kizhuyak Stream)		498	34.7%	
II. Chiniak	8	12,358		43.9%
(Buskin River)		9,951	80.5%	
III. Ugak Bay	3	191		.7%
(Pasagak River)		119	62.3%	
IV. Sitkalidak	4	1,114		4.0%
(Old Harbor Stream)		849	76.2%	
V. Alitak Bay	4	1,689		6.0%
(Moser Bay)		779	46.1%	
VI. Red River	1	25	100%	-
VII. Sturgeon River	1	20		-
(Halibut Bay)		20	100%	
VIII. Karluk	1	829		2.9%
(Karluk River)		829	100%	
IX. Uyak Bay	6	743		2.6%
(Uyak Bay)		401	54.0%	
X. Uganik Bay	7	1,908		6.8%
(Uganik Bay)		1,091	57.2%	
XI. Afognak	17	7,266		25.8%
(Afognak Bay)		4,780	65.8%	
XII. Mainland	1	84		-
(Dakovak Bay)		84	100%	
Unknown		483		1.7%
TOTAL	61	28,143	69%	100%

SOURCE: ADFG, Annual Finfish Management Report - Kodiak Management Area, 1983 subsistence salmon spot for residents of Port Lions (many of whom previously resided in the village of Afognak destroyed by the 1964 earthquake), Ouzinkie, and Kodiak city. No other district exceeds 6 percent of the total permit reported subsistence harvest. It should be noted that permit harvest data for areas likely used by rural communities (such as the Karluk River for the village of Karluk) are significantly lower than survey data for these communities.

Resource Use Area Map Data

Resource use area maps are available for each of the six Kodiak rural communities in considerable detail, but only limited map data is available for Kodiak city and the road-connected areas near the city (ADFG 1985b). Each community's geographic pattern of resource use is characterized below; they are in pairs since use areas and exchange patterns tend to link the six communities into the following three clusters: Akhiok-Old Harbor, Larsen Bay-Karluk, Port Lions-Ouzinkie. Each of these pairs of communities has certain areas of resource harvest in common with each other, but no areas in common with any of the other four rural communities.

Since species tend to occupy similar habitats throughout the study area, residents of different communities reflect similar general patterns of land and sea use for harvesting fish and game resources. Coastal areas are important for harbor seal and sea lion, which are found along rocky shores and headlands and offshore reefs and islands. Clams and other invertebrates are harvested from the intertidal zone. Crab, halibut, and other marine fishes are taken from nearshore waters, rarely in waters deeper than 30 fathoms. Salmon are taken in open waters, estuaries, and stream waters. Waterfowl are normally harvested in marshy low-lying lands at the mouths of streams or rivers. Deer are harvested from coastal, low-altitude, and upland areas depending on the time of year. Rabbit and ptarmigan are usually found in upland areas near communities.

Akhiok

Areas which Akhiok residents indicated were typically used for resource harvests were the coastlines of Alitak Bay, Portage Bay, Deadman Bay, and Olga Bay; coastal and adjacent inland areas from Kiavik Bay to Cape Trinity, and the coastal and adjacent inland areas from Cape Alitak to Cape Grant. The area most intensively used by Akhiok residents for salmon, halibut and other marine fish, clams and other invertebrates, and deer lies within Alitak Bay and is bounded on the south by a line from Cape Alitak to Humpy Cove and on the north by a line from the entrance into Olga Bay to the head of Deadman Bay. Akhiok residents reported little use west of Cape Alitak and east of Cape Trinity; when used these areas are primarily for sea lion, harbor seal, and deer.

Old Harbor

Resource areas used by Old Harbor residents overlap on the south with those used by Akhiok on the southwest coast of Kodiak Island from Humpy Cove in

Alitak Bay to Kiavik Bay. On the north, Old Harbor residents use areas also used by residents of Kodiak and the road-connected area. The general range of coastline used is from Narrow Cape in the northeast to Geese Channel northwest of Cape Alitak. Included are the coastlines and waters of Ugak Bay, Kiliuda Bay, Sitkalidak Strait, Kaiugnak Bay and Kaguyak Bay. Sitkalidak Island, Twoheaded Island (site of a major sea lion haulout area), and the Geese Islands are also used. Old Harbor residents do not use the Alitak Bay areas normally used by Akhiok residents except for waterfowling.

Silver, pink, and chum salmon are taken primarily from streams in the Old Harbor area, but are also taken in waters as far north as Dangerous Cape and as far south as Kiavik Bay. Deer are taken throughout the coastal range, usually within a mile of the shoreline except along river or stream valleys where greater penetration occurs. Trapping follows the same coastal pattern as deer hunting, but stays much closer to the beach. Waterfowl, marine mammals, intertidal resources, and marine fish are all pursued in the coastal range of Old Harbor residents.

Karluk

Residents of Karluk range for fish, animal, and plant harvests from Inner Seal Rock near Gurney Bay southwest of the village northeast past Spiridon Bay nearly to Cape Kuliuk. A major focus of resource harvesting are Karluk River and Lake, both within close proximity to the village. Located on the northern shore of Kodiak Island, the village of Karluk is exposed to the frequently stormy and unprotected waters of Shelikof Strait. As a result, Karluk residents frequently hunt, fish and trap in the more protected waters of Uyak, Zachar and Spiridon Bays to the east of the community. Waterfowl, sea mammals, clams and other invertebrates, deer hunting, and trapping activities occur throughout this range. Salmon, freshwater fish, marine fish, crab, and plants are taken from areas closer to the village.

Larsen Bay

Resource use areas of residents of Larsen Bay tend to closely parallel those of their neighbors in nearby Karluk. Larsen Bay residents use the coastal and adjacent inland areas from the mouth of the Karluk River north to Cape Kuliuk. Intensive use is made of Uyak, Larsen, Zachar, and Spiridon Bays. Less intensive use is made of the area from Harvester Island north of the village to the mouth of the Karluk River. Salmon are taken from the Karluk River, from Spiridon Bay, from Larsen Bay, and from Brown's Lagoon. Plants and freshwater fish are harvested from areas close to the community. Deer, trapping, and intertidal collecting are the activities that take residents of Larsen Bay farthest from the community.

Port Lions

Residents of Port Lions have the most extensive range of any Kodiak rural community for fish and game harvests; it extends from Miner's Point on the southwest shore of Uganik Bay north nearly to the northern tip of Shuyak Island and then southeast to East Cape of Spruce Island. Port Lions residents do not hunt or fish east of Ouzinkie Point on the southwest corner of Spruce Island.

Salmon are taken by Port Lions residents from Afognak Bay, Kizhuyak Stream, and the coastal waters of Kizhuyak Bay, Marmot Bay, and Kupreanof Strait to Chernof Point. Freshwater fish are taken from nearby Barabara Lake. Halibut, other marine fish, and crab are pursued throughout the entire coastal area. Marine mammals, a minor resource to Port Lions households, marine invertebrates and waterfowl are taken west of Shakmanof Point to Miner's Point on Kodiak Island, as well as along the coast of Afognak, Raspberry, and Whale Islands. Deer are pursued throughout the entire coastal range; Port Lions residents indicated greater use of upland areas for deer hunting than residents of the other rural communities particularly in the following areas: Kupreanof Peninsula, Uganik Island, Whale Island, Raspberry Island, and Sheratin Bay. Trapping activities were conducted close to the shoreline along the entire Kodiak Island coast from Shakmanof Point on the east to Miner's Point on the west, and also on Whale Island. No areas for plant harvests were identified.

Ouzinkie

The geographic range of Ouzinkie residents fishing, hunting, trapping, and collecting use areas extends from Spruce Cape on Kodiak Island in the southeast westward to Broken Point in Uganik Bay and north to the coast of the southern half of Afognak Island. The close proximity of Kodiak city, only 10 miles southeast of Ouzinkie, directs Ouzinkie residents' fishing, hunting, and trapping activities primarily to areas north and west of the community. The resource range of Ouzinkie residents therefore overlaps significantly with that of Port Lions, and resource areas south and east of the community in Narrow Strait and Monashka Bay are sites of heavy competition with Kodiak city residents.

Salmon are taken from Afognak Bay, streams in Kizhuyak Bay, Monashka Bay, and Viekoda Bay; and the coastal waters around Spruce Island, Whale Island and Marmot Bay. Marine fish are taken in Narrow Strait between Spruce and Kodiak Islands, north of Spruce Island, and in Kupreanof Strait west to Raspberry Island. Marine mammals are taken from Spruce Cape on Kodiak Island along the entire coast to Viekoda Bay as well as around Spruce, Raspberry, and the southern half of Afognak Island. Waterfowl are taken from Monashka Bay along the Kodiak Island coastline to Viekoda Bay and along the coasts of Spruce, Whale, Raspberry and southern Afognak Island. Crab, clams and marine invertebrates are taken primarily from nearshore waters around Spruce Island and west to Antone Larsen Bay on Kodiak Island.

Deer and trapping activities occur along the coast of Kodiak Island from Monashka Bay to Broken Point in Uganik Bay. Upland areas used for deer hunting include Spruce and Whale Island, and the uplands on Kodiak Island directly opposite Ouzinkie. Plants and berries are taken on Spruce Island and on the portion of Kodiak Island directly opposite Ouzinkie.

Kodiak Road-Connected Area

Kodiak city and residents of other areas on the Kodiak road system use most intensively areas which can be easily reached by motor vehicle or open skiff. These include Ugak Bay, Chiniak Bay, Monashka Bay, Narrow Strait, Kupreanof Bay, and Marmot Bay. In addition, areas further from town are regularly used by hunters and fishermen on longer trips. Because of the large population of the road-connected area, the great number of boats owned by local residents, and strong interest in harvesting activities, it is likely that virtually the entire coastline of the Kodiak archipelago receives some use from Kodiak resident. In addition, members of the road-connected sample of the KANA survey indicated resource harvests outside the Kodiak Island region on the Alaska and Kenai Peninsulas.

CHIGNIK

The Subsistence Division had, at the time of this analysis, compiled resource use area maps for the communities of Chignik, Chignik Lake, and Chignik Lagoon but not Perryville or Ivanof Bay (ADFG 1985c). It should be recalled that residents of these Alaska Peninsula communities have moose and caribou available to them but not deer or elk. Apparently data on crab utilization were not collected from residents of these communities since no information on this resource appears on the maps. Residents do, however, make significant use of crab resources. The following community characterizations are based on analysis of the available resource use maps.

Chignik

The community of Chignik has the most extensive geographic range of resource use of the three Alaska Peninsula communities. South of the community, a coastal strip of use extends around Castle Cape to Ship Mountain. To the north, a wider strip of hunting area extends to Coal Point in Wide Bay. Inland use to the west of Chignik is quite minimal, being limited to salmon harvesting in Chignik Lake and some trapping activities.

Salmon are harvested in close proximity--in Chignik Lake, Chignik Lagoon, and in a small portion of the coastal waters of Chignik Bay from Chignik Lagoon to Anchorage Bay. Plants are harvested along the entire northeastern shore of Chignik Bay, in Kujulik Bay, and in Aniakchak Bay. Clams and marine invertebrates are taken in the shallower parts of Chignik Bay, in Anchorage Bay, Chignik Lagoon, Hook Bay, Aniakchak Bay and Castle Bay. Marine fishing is primarily limited to Chignik Bay and Castle Bay. Marine mammals are hunted on the western extreme of Chignik Bay and in Castle Bay. Trapping activities are pursued along stream systems draining into Chignik Bay. Activities which take Chignik residents farthest from their communities are waterfowling and moose and caribou hunting. Waterfowling is pursued along the coast from Chignik south to Ship Mountain and north to Kujulik Bay. Moose and caribou hunting are undertaken primarily within three miles of the beach from Chignik Lagoon northeastward along the coast to Wide Bay. Chignik residents rarely hunt either south or west on the Bering Sea side of the Alaska Peninsula mountains.

Chignik Lagoon

Residents of Chignik Lagoon have a significantly different profile of resource use areas from their neighbors; this is due to use of inland areas of the Alaska Peninsula northwest all the way to the Bering Sea coast. On the Pacific Ocean side, coastal use extends from Castle Cape to Coal Point in Wide Bay on the north. Use of the northern portion of Kuiukta Bay on the southside is made for waterfowling, and moose and caribou hunting; however, access to these areas appear to be overland. Use of resources southeast of Chignik Lagoon along the coast of Chignik Bay to Castle Cape is limited to waterfowling and a small amount of trapping.

The area most intensively used by Chignik Lagoon residents is the interconnected system of waters which includes Chignik Lake, Chignik River, and Chignik Lagoon. Here salmon, clams, marine fish, waterfowl and marine mammals are taken. Marine mammals are taken in the western part of Chignik Bay and in Kujulik, Aniakchak and Amber Bays. Clams and marine invertebrates are taken from the western side of Chignik Bay and from Aniakchak Bay. Marine fishing is limited to Chignik Lagoon. Trapping is pursued up the Chignik River to Black Lake, in the southeastern part of Chignik Lagoon, along the western shore of Chignik Bay, and in Hook, Kujulik, Aniakchak and Amber Bays.

Waterfowling, moose and caribou hunting are the activities for which residents of Chignik Lagoon travel farthest. Waterfowling is done in a broad area on the north side of the Alaska Peninsula from Three Hills north to just past the Seal Islands; ducks and geese are also hunted around Black Lake, Mud Bay, Lake Bay, Castle Bay, Hook Bay, and Kujulik Bay. The most extensive ranges are reported by Chignik Lagoon residents for moose and caribou hunting. A broad swath across the Alaska Peninsula from Three Hills on the Bering Sea side to Kuiukta Bay on the Pacific side in the south to above the Seal Islands on the Bering Side down to the middle of Chignik Bay on the Pacific side on the north are hunted for these two species. In addition, coastal hunting on the Pacific side is conducted as far north as Wide Bay for moose and caribou. No areas for freshwater fish, crab, or plants are indicated for residents of Chignik Lagoon although undoubtedly these resources are also utilized.

Chignik Lake

The resource use areas mapped for Chignik Lake residents indicate lesser use of marine resources than residents of either Chignik or Chignik Lagoon. Similarly but more intensively than Chignik Lagoon residents, Chignik Lake villagers utilize the Chignik Lagoon, Chignik River, Chignik Lake system for a wide variety of resources including salmon, freshwater fish, waterfowl, plants, marine fish, clams and marine invertebrates, and marine mammals. A similar area of use across the Alaska Peninsula to the Bering Sea to that of Chignik Lagoon residents was reported; coastal use on the Pacific side does not extend either as far northeast or southwest as for the other two communities and is not geographically continuous.

Salmon are taken in several streams which drain into Chignik Lake as well as in Chignik Lake, River, and Lagoon. Plants are taken from a small area on the opposite side of Chignik Lake immediately across from the village. Clams and marine invertebrates are taken in Chignik Lagoon, Mud Bay, Anchorage Bay, Portage Bay, Kuiukta Bay and Castle Bay. Marine fishing and marine mammal hunting are done on the west side of Chignik Bay. Some additional marine mammal hunting is also done is Portage Bay. Trapping activities are conducted primarily on lands above Mud Bay. Waterfowling is conducted in the same areas as Chignik Lagoon residents-- on the northside of the Alaska Peninsula, around Black Lake, Chignik Lake, and Chignik Lagoon; Chignik Lake residents do not hunt waterfowl on the Pacific coastline. Moose and caribou hunting areas are similar to those of Chignik Lagoon residents, but diverge in several ways. Chignik Lake residents reported more restricted moose hunting areas limited to a zone between 10 miles from the village on the southwest to 25 miles on the northwest. Moose are not hunted on the Bering Sea side of the Alaska Peninsula nor north of Chignik Lagoon. The range for caribou hunting is much more extensive than that of moose including the north side of the Alaska Peninsula to the Bering Sea from south of Three Hills to north of the Seal Islands. Along the Pacific side, coastal hunting for caribou is done in Chignik Bay, Kujulik Bay, Aniakchak Bay, Amber Bay, and Yantarni Bay.

COMPARISIONS

Subsistence harvests are taken by households in every part of Alaska. Research by the Subsistence Division of ADF&G has documented various levels of annual per capita harvests in different communities. In the subsistence based communities of western Alaska (Bristol Bay, Yukon-Kuskokwim Delta), annual per capita subsistence harvests fall in a range from about 600 pounds to 1400 pounds (Wolfe 1985:5). In communities of the Kenai Peninsula (Kenai, Seldovia, Ninilchik, and Homer) annual per capita subsistence harvests are much smaller ranging from about 30 pounds to 100 pounds (Wolfe 1985:5). Substantially above the Kenai Peninsula communities but still well below the western Alaska communities are the annual per capita subsistence harvests of the following areas: Copper River Basin, Southeast (Haines, Klukwan, Sitka) and northern Cook Inlet (Tyonek, Skwenta). In these communities the range is from 100 to 280 pounds (Wolfe 1985:5).

How do Kodiak Island communities compare to patterns depicted for these other communities? Annual per capita subsistence harvests for the Kodiak road-connected populations (Kodiak city and environs) show a range from a low of 92 pounds for the Filipino population to a high of 203.6 pounds for the Chiniak population. This clearly places Kodiak city in the intermediate zone along with Copper River Basin, Southeast, and northern Cook Inlet communities. The figures for Kodiak's rural communities cluster in the range of 360 to 520 pounds annual per capita subsistence harvest. While below the range found in western Alaskan subsistence-based communities (600-1400 pounds) the Kodiak rural subsistence harvests place them in a category distinct from any other found in the state but well above all other communities documented to date other than western Alaskan ones.

In conclusion, Kodiak city displays a pattern of subsistence use similar to that of Sitka in southeastern Alaska. The Kodiak rural communities most closely approximate western Alaskan subsistence-based communities in their subsistence patterns; however, the production level in Kodiak rural communities is somewhat lower than that found in western Alaskan subsistence-based villages.

In the last two chapters the importance of marine and terrestrial resources for the people of the Kodiak and Chignik areas has been demonstrated. We turn next to an overall review of the elements of the regional economy.

IV. THE KODIAK REGIONAL ECONOMY: PATTERNS OF CHANGE

by Lee Huskey, Ph.D.

Introduction and Methodology

Petroleum development on the outer continental shelf off Kodiak Island would lead to changes in the regional economy. The dimensions of this change are currently unknown, and this uncertainty makes it difficult to prepare for OCS development. Without a good understanding of the potential changes, both public and private sector responses will be inefficient. The purpose of this chapter is to provide decisionmakers with information that will reduce the uncertainty about the economic consequences of OCS development.

ECONOMIC CHANGE IN SMALL ECONOMIES

The most important factor explaining both the causes and patterns of economic change in rural Alaska is the size of the local economies. These economies are uniformly small; their small markets, as measured by sales of goods and services, income, or population, determine the pattern of economic change. Two consequences of size are important for our analysis. First, external forces will be the most important initiator of change and growth in these economies. The primary force of change will be the external demand for the region's resources. In Alaska, rural regions are also affected by external government decisions which inject money into the economy in the form of government jobs, capital investment, and transfer payments. Second, the economy's small size will limit the local response to these external forces. Very few of the goods and services consumed in the region are produced there, because they can be produced cheaper outside the region and imported. This fact limits the local economic response to any externally induced growth.

Both the regional economy and the various village and city economies which make it up are small by any measure. OCS development will influence these Kodiak area economies as an additional external economic force. The type, level, and rate of OCS development will be a function of decisions made by external public sector (federal government) and private sector (oil companies) decisions. We can hypothesize about its potential effects by examining how other external forces have affected the Kodiak economies.

A simple description of a regional economy divides it into two sectors. The external sector includes those primary activities that bring income into the region by selling their products to consumers outside the region. In the Kodiak region, as in most of rural Alaska, this sector is made up of resource producers. It also includes those activities supported by external government transfers. OCS development would affect the Kodiak economy by expanding this sector and increasing the direct injection of income from outside the region. The level of income injected would depend on the local resources used, since income is payment for resource use. Since petroleum resources are not locally owned, the extent of this effect will primarily depend on the amount of local labor used and the amount of labor that migrates to the region. The final determinant will be how OCS development impinges on other activities in this sector. If OCS development reduces the level of fisheries activity, the net effect on the economy would be less than the increase in income generated by OCS.

The second sector of the economy, the support sector, generates income by selling goods and services to local residents and producers. The response of the support sector to forces such as OCS development depends on how the additional OCS income is spent, particularly on what part of the income is spent within the local economy. The portion spent locally depends, in turn, on the existing opportunities to spend locally and the propensity of entrepreneurs to expand the local support sector in response to increased demand. These opportunities and propensities depend on the size of the market and, in rural Alaska, on the attachment of the region to the market. The most important activities in the local support sector would be retail, service, and transportation industries.

The pattern of change induced by OCS development will be determined by the magnitude of the OCS income injection and the response of the local economy to it. The magnitude of the direct effect depends on the effect of OCS activity on other external economic forces, the proportion of local residents hired, and the proportion of nonresident workers who migrate to the region. The indirect effect of OCS development will depend on the expansion of the local support sector. These responses will depend importantly on the size of the place affected and the links between places within the region.

The goal of this chapter is to limit the uncertainty about the potential economic impact of OCS development on the regional economy. We do not attempt to estimate actual levels of impact. Even if we could translate levels of OCS development into levels of impact, there is currently little certainty about either resource levels or possible levels of development. Instead, we intend to isolate the important determinants of economic impact in the region. By describing the past patterns of economic change in the Kodiak regional economy, we will be able to draw hypotheses about the potential economic change associated with any level of OCS activity. The purpose of this chapter is to describe the economic relationships which will determine the economic consequences of OCS development in the Kodiak region.

METHODOLOGY

To isolate the important determinants of OCS induced economic change, the causes and patterns of past change are examined. Historical patterns of change provide an indication of likely future patterns, so we analyze the major changes experienced by the Kodiak regional economy between 1970 and the early 1980s. This period was selected because we are interested in how the economy responded to alterations in its external sector. A few points in time during this period are selected in an attempt to isolate important turning points in the economy. We assume that the economy will respond to OCS development in a pattern similar to its past response to other major external sources of change. With this assumption, we can isolate important variables and relationships responsible for past patterns of change, and these can be used to forecast future impacts.

Regional Accounts

A regional accounts framework was selected as an organizing methodology for our analysis. A full set of regional accounts would provide a complete picture of a regional economy at one point in time. The accounts would describe the level of activity by important economic sectors and the relations between sectors. Accounts provide the basis for a number of important tools used in impact forecasting. Unfortunately, construction of a complete set of accounts requires a great deal of data; much of this data is not available from secondary sources. The required collection effort for a complete set of accounts is beyond the scope of this study. Instead, in examining four important sectors--production, household, government, and investment--we asked a series of questions suggested by the regional accounts framework. This allowed consistent analysis of many different types of information. The regional accounts was used as a framework for our analysis, not as the goal of the analysis. The main goal was to understand the relationships between sectors and to extend this understanding to the potential effects of OCS development.

The following questions, suggested by the regional accounts framework, were used to guide the analysis.

1. What is the level of activity in each sector and how has that level changed over our relevant historical time period?

2. How does the level of activity in each sector affect activity in other sectors? The description of these linkages is essential in construction of regional accounts. In addition to examining linkages between sectors, we are also interested in spatial linkages. Spatial linkages occur between local economies in the region.

3. What linkages exist between sectors within the regional economy and sectors outside the region? This addresses imports to and exports from the region as well as the payment for the labor working outside its region of residence.

By examining the economic relationships at different points in time, we can develop an understanding of the extent and causes of any change in the structure of these relationships.

Two problems common to most work in regional economics occur in this study. Information is often provided in various units ranging from physical output to employment to dollars. A second problem is that information about local economic activity rises in proportion to the size of the place. This means we are able to say more for the regional than the local economies and more for Kodiak city than the villages.

The Kodiak Regional Economy

The communities in the study region reflect a diversity of community types. The 13 cities and villages vary in size from Kodiak city, which is one of the larger communities in Alaska, to small villages of less than 100 people. They vary in cultural makeup from being predominantly Native to predominantly non-Native. They vary in attachment to the market economy. Finally, they vary in function from communities with strong attachment to fishing to those with no real attachment. Included in this group is Cold Bay, which in many ways is typical of an enclave single-purpose community which may be characteristic of future development in rural Alaska.

The regional economy is on two levels. First, the Kodiak regional economy consisting of the communities on Kodiak Island is examined. Second, the village or community economies are discussed. These two levels reflect the fact that Kodiak is a true functioning regional economy, and the availability of data. More data is available for the census division than for the communities; this allows us to say much more about the Kodiak region than any individual community.

The economy of the study region cannot be described as a functional regional economy. While there are cultural and some economic links among the villages, the economic ties are not strong. The communities can be separated into three groups. First, the communities on Kodiak Island form a relatively integrated region with Kodiak city serving as the regional center. Second, the communities on the Alaska Peninsula may have only modest economic linkages, but they have strong economic similarities. Because of the similarity of size and economic base, these villages can be treated as a homogeneous region. Finally, Cold Bay is separate since its commercial links are to Anchorage and its economic functions are unlike those of any other community.

ECONOMIC GROWTH: 1970-1983

The economies are examined over a period of relatively rapid change. Table 83 displays indicators of change in the Kodiak Borough.[1] Nonagricultural Wage and Salary employment does not count all employees, since it does not include the majority of fishermen, but it does provide an indicator of the growth of economic activity. This employment grew at an annual average rate of 4.8 percent per year. Employment in the latter part of the period was sporadic, rising rapidly then falling, and then rising. Resident income (in real 1980 dollars) exhibits a more steady rise, which reflects the importance of nonresidents in Kodiak employment; much of the employment fluctuation may come at the expense of non-residents' jobs. Real resident income increased at an annual average rate of growth of 4.4 percent (through 1982). Population has risen more slowly than either employment or income; it grew at an annual average rate of only 2.3 percent (civilian population increased slightly faster at a rate over 3 percent). There are a number of explanations for this. Foremost is the closure of the Kodiak Naval Station in 1971, and its replacement by the Coast Guard base. Coast Guard population has grown steadily since 1972, but is still less than the Navy contingent in 1970. In addition, much of Kodiak's increased regional economic activity occurred as incomes of local resident increased and through the increased use of non-resident labor.

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[1] Much more information is available on the census division level, so the "region" examined is the Kodiak census division. The communities outside Kodiak are discussed in the communities section.

TABLE 83

Kodiak Borough Economic Growth
1970-1983

	Population[1]	Income[2]	Total Nonagricultural Wage & Salary Employment
1970	9,600 (1,491)	85.0	2,662
1971	9,700 (1,294)	88.9	2,821
1972	9,200 (682)	83.6	2,878
1973	9,300 (680)	102.8	3,576
1974	9,500 (682)	105.1	3,641
1975	9,700 (877)	108.6	3,777
1976	9,900 (866)	115.5	4,481
1977	10,100 (976)	114.8	4,130
1978	10,300 (897)	124.3	4,639
1979	10,600 (892)	121.3	---
1980	11,000 (1,098)	125.5	4,464
1981	11,700 (1,073)	125.8	4,381
1982	12,700 (1,010)	142.0	4,399
1983	12,896 (1,095)	---	4,880

[1] Population in parentheses is military population.
[2] Millions of 1980 dollars resident income (using Anchorage CPI)

SOURCES:
1. Bureau of Economic Analysis, U.S. Department of Commerce, Local Personal Income, various years. Information not available for 1983.
2. Alaska Department of Labor, Alaska Population Overview, 1982.
3. Alaska Department of Labor, Alaska Labor Force Estimates by Area, various years.

Table 84 shows similar indicators for the study region's communities. Of the communities, seven experienced population growth between 1970 and 1980. Chignik experienced the greatest proportionate growth, almost doubling between 1970 and 1980. Population in the region has also increased its concentration in Kodiak city (Kodiak's share of the total study region population increased from 76 percent to 80 percent). In real terms, income increased in all communities but three: Karluk, Akhiok, and Cold Bay. These are the only villages in the region where no commercial fishing took place. Only in Cold Bay and Karluk did real income grow less than population. Finally, the number of residents with jobs increased in eight communities and remained constant in the others.[2]

TABLE 84

Community Economic Growth

	Population		Income		Employment	
	1970	1980	1970[2]	1980[2]	1970	1980
Kodiak[1]	5,341	7,472	44,092	85,520	2,467	4,080
Akhiok	115	105	284	252	--	18
Karluk	98	96	781	202	--	28
Larsen Bay	126	168	649	747	27	49
Old Harbor	290	340	1,069	1,280	45	44
Ouzinkie	160	173	800	1,732	40	43
Port Lions	227	215	1,309	1,583	74	76
Chignik	83	178	659	1,375	6	67
Chignik Lagoon	--	48	--	444	--	11
Chignik Lake	117	138	141	425	13	23
Perryville	94	111	445	518	17	12
Ivanof Bay	48	40	--	189	1	9
Cold Bay	256	228	2,619	1,337	81	145

1 Approximates city and road connected. Does not include Coast Guard base.
2 In thousands of 1980 dollars

SOURCE: U.S. Department of Commerce, Bureau of Census, 1980 Census Tapes

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[2] Census definitions of employment refer to current employment (at the time of the census), and do not annual average employment as in Table 83.

EXTERNAL PRODUCTION SECTOR

The external production sector includes all activities that produce goods and services on Kodiak Island. This sector has two major components that reflect where they sell their products. The external production sector consists of the fishing industry and tourism. A forest products industry has been incidental in the past, but potentially will be more important in the future. Tourism includes certain activities in the service and trade industries. The second component of the production sector includes economic activity produced for local consumption. This includes industries primarily in the Trade and Service sectors. The delineation of the external and internal components of the production sector by industry is not exact. Industries often serve both external and internal markets. An exact disaggregation can be made only through survey. The internal production sector will be discussed in a later section.

The distinction between external and internal sources is important for our methodology. We assume that change in the external sector is the major determinant of overall economic change. The growth of the internal sector comprises the major part of the local economic response. In what follows we examine the growth and linkages in each industry component.

Fishing Industry

The fishing industry has two primary components--harvesting and processing. Both of these are important in the region.[3] Fishing has been a major component of the Kodiak economy in recent history and is one of the most important determinants of growth. Fishing also provides the primary linkages with other regions. There are three important external linkages with the fishing industry. First, the demand for fish is external to Kodiak since sales are primarily exported to other regions. Secondly, factor payments are made outside the region. Fishermen and cannery workers are often not full-time residents. Cannery owners are also not Kodiak residents, so that returns to factor owners flow off the island. Finally, Kodiak fishermen fish outside the region's waters, and canneries process fish harvested outside the region.

The pattern of growth in fish harvesting income and output is shown in Table 85. Changes in fisheries earnings result from changes in the number of fish caught and the price received for the fish. A reduction in pounds may be balanced by an increase in price. In addition, changes in the type of fish caught will affect fishermen incomes. As Langdon (see Chapter II) shows, the composition of Kodiak fish catch has changed over the period in response to a dramatic downturn in crab stocks.

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[3] In this section we discuss only the Kodiak Borough area in a regional context. This reflects availability of data. Other communities are discussed below on a community basis. Larsen Bay earnings are not included in the analysis.

In real terms, Table 85 shows the cyclical pattern of incomes in the fish harvesting industry. Both the value of fish caught in the Kodiak Management Area and the Kodiak resident earnings rose dramatically between 1975 and 1978; earnings more than tripled during this period. Earnings remained relatively high for a four-year period, turning down significantly in 1982 and 1983 (Kodiak earnings were less than half the 1978 peak in 1983). Earnings in 1983, although off the peak, were still almost half again as great (in real terms) as in 1975. This table also suggests the nature of an important spatial linkage in Kodiak. For the later part of the period Kodiak resident incomes exceed those earned in the Management area while prior to 1977 Management area earnings are greater. Income flows out of the Kodiak region as fishermen from out of the region fish in Kodiak and into the region as Kodiak fishermen fish in other areas.

TABLE 85

Kodiak Fish Harvesting Industry

	Kodiak Management Area Fish Value to Fishermen[1]	Kodiak Resident Fishermen Gross Earnings[1]
1975	$ 44,096	$ 29,910
1976	75,880	57,637
1977	68,650	84,486
1978	89,377	103,258
1979	69,291	92,980
1980	69,407	89,741
1981	98,636	90,558
1982	78,450	74,045
1983	42,751	43,221

1. In thousands of 1980 dollars.

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SOURCE: Chapter II

Since the fishing industry represents a major source of change for the Kodiak regional economy, we need to understand the reasons for the cyclical pattern. Resource economic cycles have two primary causes. First, the cycles follow the biological pattern of the resource stock. As the recent decline of the crab stocks has shown, biological resource levels fluctuate. Second, the earnings cycle will reflect changes in the market for the resource. If the price of the resource declines, the same level of harvest will be worth less to the fishermen. Price changes may moderate the effect of resource cycles on earnings; as the resource harvested declines, prices may go up to soften the decline in earnings. This effect will be limited to the extent the resource is available in other regions. For example, if Bristol Bay salmon runs are good, this will have a depressing effect on the price of Kodiak salmon even if Kodiak has poor harvests. Each of these factors was at work in the Kodiak region during our study period.

An additional factor to understand the Kodiak earnings cycle is the fisherman's response to changes in either resource levels or prices. In response to a decline in income from traditional pursuits, fishermen will change the pattern of economic activity. Fishermen have a number of potential responses. These include dropping out of fishing, mixing off-season non-fishing work with traditional pursuits, expanding the type of fish harvested, and expanding the locations in which they fish. Any individual fisherman may exhibit more than one of these responses.

Table 86 expands the notion of spatial linkages for Kodiak city fishermen (consistently close to 95 percent of the region's fish earnings are in Kodiak city). Over the period we see two changes in spatial linkages. First, Kodiak city resident fishermen are expanding their fishing region into other management areas; earnings from outside the Kodiak management area rose from 15.4 percent in 1975 to 36.5 percent in 1983. Second, the non-Kodiak city share of the Kodiak Management Area earnings has declined from almost 47 percent in 1975 to only 26 percent in 1982. Each of these spatial changes may reflect responses to changes in the fishery. As income in traditional fishing pursuits decline, fishermen change both species harvested and areas fished, expanding beyond traditional activities. In addition, the high valued crab fishery attracted fishermen from outside the region. When these stocks disappeared, it was no longer worth outside participation.

TABLE 86

Fish Harvesting Industry Linkages
Kodiak City

	Share of Earnings by Management Area			Non-Kodiak City Share of Kodiak Management Area
	Kodiak	Chignik	Other	
1975	84.7%	2.9%	12.5%	47.2%
1976	67.3	4.2	28.5	53.2
1977	60.2	2.4	32.4	29.8
1978	62.0	5.4	32.6	35.7
1979	64.1	5.0	30.9	24.5
1980	66.3	2.7	31.0	22.8
1981	83.2	6.3	10.5	32.8
1982	87.8	3.9	8.3	25.8
1983	63.5	5.5	31.0	--

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SOURCE: Chapter II

The effect of changes in resident fishermen earnings on the Kodiak regional economy depends on three factors. First, there are gross earnings; the cost of catching the fish affects the level of income available for spending in Kodiak. The greater the share of costs, the less income fishermen have to spend in Kodiak. The dampening effect of these fishing costs depends on the extent that this spending occurs in Kodiak. A major component of these costs is crew incomes.

The second factor determining the impact of increased fishermen earnings on the Kodiak economy is the number of people involved in the fishery. The economic impact differs if incomes rise but per capita incomes remain the same as the number of fishermen increases, or if population stays the same while per capita incomes increase. As individual incomes increase, individuals spend a smaller portion of their income; the goods people buy as their incomes increase may also have a lower local content. These differences in spending patterns make the economic effects different for a given increase in income if per capita incomes or the population increases.

The final factor which determines the effect of changes in fishing income on the Kodiak economy is expectations. As we can see, fishing earnings increased rapidly from 1975 to 1978. If the important economic agents (households, entrepreneurs, etc.) believed these high incomes would be maintained, they would act differently than if they realized the increase was transitory. The proportion of income which is spent and affects the local economy depends on residents' expectations.

Table 87 provides a rough estimate of how the gross earnings of fishermen have been distributed. The rapid increase in fisheries earnings attracted a number of new entrants into the Kodiak fishery. From 1975 until 1981 the number of fishermen (those reporting earnings) increased. This coincided with the increase in gross earnings. The response as gross earnings fell was logged. Although 1978 was the peak year for gross earnings, significant declines in fishermen did not occur until after 1981.

Estimates of crew employment, crew share, and net earnings are rough calculations which can be used to estimate the relative impact of a level of gross earnings on the Kodiak economy. Net earnings reflect cost assumptions based only on the salmon fishery and so will be more sensitive to the mix of fishery. These shares more than likely fluctuated during the period representing changes in the composition of the fleet and relative abundance of the resource. These numbers are not assumed to be correct estimates but simply reasonable estimates which can be used to assess the relative importance of the fisheries sector. (The figures in Table 87 are useful for illustrating one point: the net income of fishermen does not move in the same pattern or magnitude as fishermen's gross earnings.)

The second component of the fishing industry is fish processing. Table 88 illustrates the growth of employment and wages in fish processing, which has experienced rapid and cyclical growth mirroring the harvesting sector. Average annual employment in this sector more than doubled between 1970 and 1980, as did wages and salaries; both fell after 1980. Unlike earnings in the harvesting sector, real wages and salaries in 1982-83 were below the 1975 level.

TABLE 87

Fishermen Income
Kodiak
(Thousands of 1980 dollars)

	Number of Fishermen[1]	Crew Estimate[2]	Gross Earnings[1]	Kodiak Crew Share[3]	Net Earnings[4]
1975	471	747	$29,910	$ 6,380	$ 1,896
1976	551	873	57,637	12,295	14,674
1977	654	1,037	84,486	18,022	26,258
1978	694	1,100	103,258	22,026	35,347
1979	799	1,266	92,980	19,834	26,450
1980	837	1,327	89,741	19,143	23,495
1981	909	1,441	90,558	19,317	21,719
1982	878	1,392	74,045	15,795	13,595
1983	712	1,129	43,221	9,220	1,771

[1] From Langdon, Chapter II

2 Annual average fish harvesting employment based on multipliers in G. Rogers, R. Listowski, D. Moyer, Measuring the Socioeconomic Impacts of Alaska Fisheries, ISER, 1980. Includes captain; average crew size of 3.2.

[3] Assume crew share of 32 percent of gross, and two-thirds resident share.

[4] Based on following cost assumptions:
a) fixed cost of $30,900 per boat
b) operating cost (including crew share) of 45 percent of gross based on purse seine costs in 1977 found in G. Rogers and J. Kreinheder, Socioeconomic Analysis for Fishery Areas and Census Divisions, Limited Entry Study Committee, 1980.

TABLE 88

Fish Processing Employment and Payroll

	Employment	Total Wage & Salary 1
1970	701	10.473
1975	1,108	18.537
1980	1,544	22.761
1982	1,166	16.008
1983	1,285	12.643

1. Millions of 1980 dollars

SOURCE: Alaska Department of Labor, Statistical Quarterly, various years.

Table 89 describes the processing industry at two points in time--1967 and 1977. Over this time period the value of output grew by over 400 percent in real terms. The components of this output did not expand proportionately, materials costs increased by 5.5 times, while payroll and value added increased by only slightly more than two times. The primary component of material inputs is purchase of fish; for the U.S. as a whole this accounts for around $.60 for every dollar of intermediate inputs (see Table 90).

TABLE 89

Fish Processing Activity[1]
Kodiak Island

	No. of Firms	Value of[2] Output	Cost of[2] Materials	Payroll[2]	Value Added[2]
1967	19	39.3	19.3	8.8	20.0
1977	22	158.2	105.9	19.7	52.4

1. Firms in Foods & Kindred Products Industry Classification
2. Millions of 1980 dollars.

SOURCE: U.S. Department of Commerce, Bureau of Census, Census of Manufacturing, 1967, 1977.

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Like all sectors driven by external demand, the fish processing sector can influence the local Kodiak economy in two ways--by purchasing inputs and by the re-spending of incomes locally by processing employees. Each of these effects is less than either total spending on inputs or total wages and salaries. Table 90 shows the distribution of spending for the U.S. seafood processing industry; the table shows spending per dollar spent on intermediate inputs. By far the largest direct spending is on fish--close to 60 cents per dollar of inputs. This table shows the majority of non-manufacturing inputs for the fish processing industry. Under reasonable assumptions, purchased inputs approached two and one-half cents on the dollar, or $2.6 million in 1977. The purchase of non-fish, non-employee inputs locally is not a major factor in the Kodiak economy.

The impact of employee spending will be limited by the share of employees who are residents of Kodiak. Fish processing, like many resource industries in Alaska, is a seasonal industry commanding huge amounts of effort over seasonal peak periods. The processing industry has traditionally imported workers to fill this seasonal labor demand. Seasonal employees spend little of their earnings in host communities and provide a major sources of income leakage from the local economy. The seasonality of employment is especially important in the salmon fishery which has a short (3 month) summer season. The seasonality, and therefore the resident component of employees, will depend on the composition of the catch, processing of fish with seasons which complement salmon (such as crab) or have

TABLE 90

Miscellaneous Purchases of U. S. Fish Processing Sector (cents spent per dollar of total intermediate inputs)

	Canned Seafoods	Frozen/Fresh Fish	Local Purchases[1]
Fish	56.50	60.4	--
Wholesale Trade	16.10	14.77	.77
Retail Trade	.03	.04	.04
Transportation	2.14	1.75	.10
Rail	.21	.30	
Warehousing	.47	.53	
Water	--	.02	
Air	1.46	.90	
Bus. Services	2.93	2.20	.64
Utilities	.97	.73	.43
Finance	.73	.52	.03
Real Estate	.89	.96	.46

1. Assumes 5 percent of wholesale trade, transportation, and finance; 25 percent of business services; and 50 percent of utilities and real estate are local purchases. This reflects the spatial separation of processing and storage facilities.

SOURCE: U.S. Department of Commerce; Bureau of Economic Analysis, The Detailed Input-Output Structure of the U.S. Economy: 1972.

year-round harvest periods (such as bottom fish) will reduce the seasonality and increase the resident share of employment. Table 91 compares average annual, peak month, and the average of lowest months employment in the processing industry.

TABLE 91

Resident Processing Employment

	Average Annual	Peak	Average 3 Lowest Months	Share of Man Months Resident[1]	Share of Man Months Nonresident
1970	701	1,473	415	59.2	40.8
1975	1,108	1,631	666	60.1	39.9
1980	1,544	2,594	1,152	74.6	24.4
1983	1,284	2,956	670	52.2	47.8

1. Assumes resident share of total man months is equal to ratio of three lowest months to average annual employment.

SOURCE: Alaska Department of Labor, Statistical Quarterly, various years.

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Seasonality of processing employment can be measured by comparing the ratio of peak-to-low month employment. Seasonality seems to have followed the crab cycle, falling from 3.5 in 1970 to 2.3 in 1980, and rising to 4.4 in 1983. If we assume the average employment in the lowest three months is a proxy for resident employment, resident share of income is approximately 50 percent in 1983. This share probably held throughout the period. The only estimate of resident employment is found in the census. The 1980 census found 863 residents employed in the industry; this is 56 percent of the annual average employment. The seasonal-nonresident component of employment reduces the flow of income from the processing sector to other sectors of the local economy; during our study period as much as half the wages paid in processing leaked out of the region.

Fishing Industries in the Communities

Fishing activity in communities on Kodiak Island and within the other parts of the study region can be examined to isolate variation across communities. As with most of this study, data availability varies by place.

Tables 92 and 93 describe fish harvesting incomes in the communities within the study region. Of the communities in the region, Kodiak city earns the majority of fishing industry income, while two communities earn no income through fishing. Of these, one stopped fishing after 1978 and one after 1980. As Table 93 shows, non-Kodiak city villages depend much more importantly on salmon than Kodiak city, with over 50 percent of total earnings in all but Port Lions coming from salmon. In Kodiak city, salmon accounts for no more than 27 percent of earning throughout the period. The Chignik villages are all totally dependent on salmon. This suggests the villages are less diversified and their economies will follow any cycle in the amount or price of salmon. Lack of diversification could result from type of gear owned as well as location. This also means the economies may have only seasonal attachment to the market economy.

Visitor Industry (See Chapter VI for additional details)

The visitor industry provides another external source of change. Those sectors providing goods and services to visitors to the region are serving an external demand; decisions on the purchase of the region's goods and services are made outside the region and additional income is injected into the regional economy by these purchases. In reality, the visitor industry has two components, serving tourists and business visitors. We treat both types of visitors similarly.

Currently Kodiak city and its road-connected area receive the primary impact from tourism. Although sport hunting and fishing have experienced recent growth in island areas outside the city, the primary economic impact is in the town, so in this section we discuss the community's tourism industry. Of the total visitors to Alaska in 1983, 1.5 percent visited Kodiak and 1.9 percent of all visitor days were spent in Kodiak (Alaska Dept. of Commerce and Economic Development, 1983). Kodiak seems to have

TABLE 92

Fish Harvesting Gross Earnings by Community[1] (thousands of 1980 dollars)

	1975	1978	1980	1983
Kodiak City	$28,235.0	$97,471.0	$85,161.2	$40,752.3
Akhick	-0-	114.9	-0-	-0-
Karluk	84.0	277.2	84.8	-0-
Old Harbor	479.6	2,374.8	2,064.0	1,304.2
Ouzinkie	148.1	961.2	1,275.2	424.6
Port Lions	874.2	2,058.6	1,156.2	740.0
Chignik	168.4	1,024.0	672.8	1,539.9
Chignik Lagoon	415.3	3.058.4	1,024.3	1,709.6
Chignik Lake[2]	121.5	1,571.2	668.2	794.9
Ivanoff Bay[3]	*	*	*	*
Perryville[2]	235.5	1,897.4	517.3	782.5

[1] Larsen Bay is not included in data.
[2] Assume confidential earnings represent the average.
[3] Only confidential data for Ivanoff Bay.

SOURCE: Chapter II

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captured a fairly constant share of state visitors; a 1977 study found that 2 percent of summer visitors and 4 percent of winter visitors to the state went there (Alaska Dept. of Commerce and Economic Development, 1978). Changes in the level of spending by these visitors provide a source of growth for the Kodiak economy. On a statewide basis the most important source of change in visitor expenditures has been the growth of the number of visitors. However, per capita visitor expenditures have also increased (in 1980 dollars) from $941 in 1977 to $1,277 in 1983. This increase occurs across all types of expenditures except transportation to Alaska, which remained constant in real terms.

Table 94 shows the estimated 1983 non-resident visitor impact on Kodiak. This table assumes expenditures are proportional to time spent in the region. Not all visitor expenditures affect the Alaska economy; this is especially true of transportation to and from Alaska and prepaid cruises which are assumed not to affect the Kodiak economy. We also assume that a proportional amount is not spent in Kodiak on gasoline and souvenirs. Our estimate of the non-resident visitor impact to the Kodiak economy is $10.9 million in 1983 ($9.2 million in 1980 dollars).

Table 95 shows the non-resident visitor impact projected back to 1970. This projection assumes increases in both the number of visitors and per capita expenditures over time. According to our definition, nonresident visitor expenditures have approximately doubled since 1975 and almost tripled since 1970.

TABLE 93

Fish
Species by Community[1]
Percent of total earnings attributable to Salmon

	Akhiok	Karluk	Old Harbor	Ouzinkie	Port Lions	Kodiak City	Chignik	Chignik Lagoon	Chignik Lake	Perryville
1975	---	100.0	83.1	100.0	22.1	15.8	100.0	100.0	100.0	100.0
1976	100.0	100.0	96.9	82.7	55.6	24.8	100.0	100.0	100.0	100.0
1977	100.0	100.0	100.0	93.9	41.2	22.0	100.0	99.6	100.0	100.0
1978	100.0	100.0	100.0	83.6	26.3	23.5	100.0	100.0	100.0	100.0
1979	---	100.0	84.6	68.0	34.4	20.8	100.0	97.4	100.0	100.0
1980	---	100.0	93.4	67.7	43.7	18.6	100.0	100.0	100.0	100.0
1981	---	---	95.9	57.8	30.3	26.9	100.0	100.0	100.0	100.0
1982	---	---	70.1	51.7	21.9	17.3	100.0	100.0	100.0	100.0
1983	---	---	56.1	63.8	30.5	17.1	100.0	100.0	100.0	100.0

[1] Data for Larsen Bay not available at time of preparation

SOURCE: Chapter II.

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TABLE 94

Nonresident Visitor Expenditures
Kodiak--1983

Category	Per Party in Kodiak	Total Expenditures ($000,000)
Gasoline/Auto Repair	$122*	1.232
Car Rental/Taxi	56	.566
Other Transportation	200	2.020
Lodging	275	2.777
Food/Beverage	190	1.919
Souvenir/Gifts	110*	1.111
Other	122	1.232
Total		10.857

* Assumes expenditures for those who visited Kodiak in same proportion as time spent except for Gasoline and Souvenirs, where one-half of that amount is assumed.

SOURCE: Alaska Department of Commerce and Economic Development, Divison of Tourism, Alaska Traveler Survey and Visitor Industry Analysis, 1983

TABLE 95

Estimated Non-Alaska Visitors and Expenditures
Kodiak--1970-1983[1]

	Visitors	Expenditures (millions of 1980 dollars)
1970	6,121	3.328
1975	9,974	4.923
1980	12,474	7.281
1983	15,550	9.209

[1] Visitors assumed to grow in proportion to visits to the state's international airports. Expenditures per capita are assumed to change at the rate found between 1977 and 1983, 8.1 percent per year.

SOURCE: Table 94

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Table 96 translates the expenditure impact into employment. Visitor expenditures provided 255 jobs in Kodiak in 1983; of these the major sectors are restaurants and hotels. This table provides an estimate of the employment impact of total visitor expenditures, not simply nonresident visitors. This employment breakdown is important for our study, since the industries affected by visitors are also those which serve the local population. In attempting to isolate the response in the local economy to external forces, we need to isolate the portion of trade and service industries which respond directly to external demand.

TABLE 96

Employment Impact of Visitor Industry--Kodiak

Industry	Nonresident Visitor Employment	Total Visitor Employment[1]
Retail		
Service Stations	2	3
Eating and Drinking	49	70
Miscellaneous Retail Food	7	12
Miscellaneous Retail Trade	30	34
Apparel	2	4
General Merchandise	2	14
Service		
Auto Repair	4	5
Hotels	59	63
Entertainment	2	4
Personal Services	1	5
Transportation		
Air Transportation	17	29
Ground (local)	12	12

[1] Assumes Kodiak has the same proportion of Alaska resident visitor employment as population.

SOURCE: Alaska Dept. of Commerce and Economic Development, Division of Tourism, Alaska Traveler Survey and Visitor Industry Analysis, 1983.

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THE GOVERNMENT SECTOR (See Chapter V for additional details)

A second major element of the external forces affecting the Kodiak area economy is the government sector. Decisions are made at the state and federal government levels that result in money being injected into the Kodiak region. These decisions affect the flow of funds into the region and the level of employment in four main ways. First, state and federal governments have employees in the region. The incomes of these employees are re-spent providing a source of growth. Second, state and federal construction projects provide cash injections into the regional economy as local residents are hired on construction projects. Third, the state and federal governments directly transfer funds to local governments and nonprofit corporations which allows them to employ people and carry out projects in the region. Finally, state and federal governments make transfer payments to residents of the region, such as Permanent Fund Dividends or Social Security payments, which become income to be re-spent by the local population. Each of these mechanisms is an external determinant of regional economic activity. In this section the first three of these mechanisms are discussed, primarily as they affect regional employment. The role of transfers is examined later in our analysis of incomes flowing to households.

The Kodiak Coast Guard Station provides the most important direct employment impact of the state and federal governments. Table 97 shows the historical pattern of change in this employment and payroll. In 1972 the Coast Guard took the base over from the Navy, and military personnel has grown continually since that time, increasing by over 60 percent in 11 years. Assuming civilian personnel have maintained a ratio to military personnel found recently, federal civilian personnel on Kodiak are primarily associated with the Coast Guard. In 1979, the Coast Guard estimated that 250 civilians were employed on base, which was more than 80 percent of total federal civilian employment in Kodiak (U.S. Coast Guard, 1979). Although employment has grown over the period, military employment is still less than in 1970, when the Navy had the base.

TABLE 97

Kodiak Military Personnel and Payroll

	Military[1] Personnel	Military[2] Payroll
1970	1,491	---
1971	1,294	---
1972*	682	---
1973	680	---
1974	682	---
1975	877	18,187
1976	866	17,959
1977	976	20,540
1978	897	19,272
1979	892	17,246
1980	1,098	17,316
1981	1,073	19,912
1982	1,010	22,102
1983	1,095	23,962

* Navy turned over base to Coast Guard in 1972.

[1] July 1 estimates from Alaska Department of Labor, Alaska Population Overview, 1982, 1983.

[2] 1977-1982 from Bureau of Economic Analysis, Local Area Personal Income, printouts. 1975, 1976, 1983 estimated by ratio. Thousands of 1980 dollars.

The impact of the Coast Guard on the Kodiak regional economy depends on the Coast Guard's direct purchases from the economy and the local purchases of the military and civilian personnel. Kodiak and the base share certain public facilities, such as schools and the airport (U.S. Coast Guard, 1979). However, since the base provides many retail and service activities at subsidized, non-taxed prices, there are only limited re-spending or consumption linkages between the base and urban economy. The major linkages are direct Coast Guard expenditures and consumer expenditures of civilian employees.

Table 98 estimates the size of the direct expenditures by the Coast Guard to Kodiak firms; data is taken from the Contract Register which describes Coast Guard expenditures. Of the three years surveyed, Kodiak firms received an average of 26 percent of total contract dollars, approximately $900,000. This amounts to less than 4 percent of military payroll. There is much variation by year, with expenditures ranging from two-thirds less to one one-quarter more than the average. The variation is a function of the type of expenditures; the more manufactured products the Coast Guard buys, the more limited the Kodiak share. This direct linkage has a minor effect on the Kodiak economy primarily through construction employment.

TABLE 98

Kodiak--Coast Guard
Direct Expenditure Linkage

	Base Contracts		
	Total (000)	Kodiak share	
		($000)	%
1981	$ 2,358.1	995.0	42.2
1980	6,020.0	1,084.3	18.0
1979	1,918.8	593.5	24.6
Average	$ 3,432.3	890.9	26.0

SOURCE: U.S. Coast Guard Contract Register, various years.

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Consumer re-spending by Coast Guard employees has a two-way effect on the local economy. First, civilian employees spend Coast Guard dollars in the Kodiak economy, generating economic activity in the region. However, a second counterflow reduces the effect of this expenditure. Civilian residents of the Coast Guard base, primarily dependents, earn income in Kodiak and spend it on the base. This is really a flow of income out of the regional economy or a leakage, which diminishes the economic effect of the Coast Guard base.

Table 99 estimates the consumer spending leakage. It is an underestimate since it assumes base residents buy nothing off base and that civilian residents earn the average yearly wage in the industry in which they are employed. Nevertheless, the table shows that because of the two-way flow of income, the net impact is reduced by approximately one third of the direct federal civilian payroll.

TABLE 99

Kodiak--Coast Guard Leakage
(1980)

	Employees	Payroll ($000,000)
Federal Civilian[1]	250	7.18
Employed on-base residents[2]	238	2.94
Net Inflow		4.24

[1] Based on estimate in U.S. Coast Guard, Alaska Development Plan, 1979. Employees times average federal civilian wage.

[2] Non-military employed population living on base. Employees by industry multiplied by average wage by industry by average weeks worked (U.S. Dept. of Commerce, Bureau of Census, 1980 Census Tapes).

Non-Coast Guard federal and state employees also contribute to the Kodiak economy. Table 100 shows the direct employment effect of state and federal government expenditure decisions during our study period. Two categories of employment are shown--direct and transfer based. Direct employees are those hired by government. A counterbalancing flow to this employment effect is the leakage to federal and state government through taxes. Transfer based employees are employees of local governments and nonprofit organizations funded by grants from state and federal governments. We consider these employees the result of external decisions because of the nature of their economic effect. Only a portion of this employment would be eliminated if higher level government transfers were not available. However, if these positions were funded out of local tax revenues, this would reduce local disposable incomes. In this case, transfer based employees would represent no gain in income for the Kodiak economy.

The employment numbers in Table 100 are reasonable estimates of the employment employment effects of these transfers based on the analysis of the flow of funds presented in Chapter V. School employees are the major share of local government employees funded by non-local revenues. The primary components of government support employment are KANA, social service organizations, and health sector employees. This sector increased by almost eight hundred percent between 1970 level and 1983. These transfers represent major income injections into the Kodiak economy.

Three major changes in this sector are evident from Table 100. First, the direct employment associated with state and federal spending has expanded dramatically during the study period. Employment rose from 831 in 1980 to 1,694 by 1983; employment rose by more than 45 percent. The rate of growth is much faster after 1975, since direct federal employment fell between 1970 and 1975 in response to the closure of the Naval Station. The second pattern is the increased importance of state employees; state employees accounted for 31 percent of direct employment in 1970 and 52 percent in 1983. Finally, transfer based employment has become a much more important component of the total, rising from 32 percent in 1970 to 55 percent in 1983. These changes reflect the rapid increase in state spending experienced since the late 1970s.

TABLE 100

External Civilian Employment Effects
of Government Spending
(Kodiak)

	Direct Employees		Transfer Employees	
	Federal	State	Local[1]	Gov't Support[2]
1970	387	171	243	30
1975	268	199	258	78
1980	286	208	287	239
1983	253	273	380	262

[1] Based on share of revenues from state and federal sources.
[2] Includes all of social services, one-half health, and net increase in membership organizations after 1975.

SOURCE: Alaska Dept. of Labor, Alaska Labor Force Estimates by Industry and Area, various years.

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The final component of the government sector is construction.[4] Table 101 shows the change in construction employment over the period. Government support of construction projects has been important throughout the period, but the last few years have seen the importance increase, especially the state programs.

Although the share of government generated construction activity cannot be separated, we can estimate that a major share of post-1980 employment is government sponsored. If we assume that other sectors generate the pre-1980 average, government construction accounts for 124 employees in 1982 and 400 in 1983. This is most certainly an underestimate since the effect of government loan programs is not considered. Even with this low estimate, government would account for 69 percent of total construction activity in 1983.

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[4] Non-government construction is part of the investment sector. This sector is treated in Chapter VII.

TABLE 101

Construction Industry
(Kodiak)

	Employment[1]	Earnings[2] (Thousands of 1980 Dollars)
1970	46	3,908
1971	--	4,785
1972	125	4,523
1973	131	4,703
1974	206	7,565
1975	269	11,509
1976	253	12,019
1977	212	9,064
1978	230	9,492
1979	149	5,392
1980	101	4,457
1981	136	6,133
1982	304	16,027
1983	582	30,683

[1] SOURCE: Alaska Department of Labor, Alaska Labor Force Estimates by Industry and Area, various years.

[2] SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis, Local Area Personal Income, various years (1983 is an estimate based on 1982 ratio).

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One problem with the massive increase in government sponsored activity in the construction sector is one of absorptive capacity. The rapid increase in jobs requires importing labor. To the extent this labor lives in the region only to work on the project, the consumer spending linkages are minimal. A major project on Kodiak which has these characteristics was the Terror Lake Hydro Project. The project began in 1982. Table 102 shows the results of a survey of project employees. Slightly more than one-fourth of project employees claimed Kodiak as their residence, while only 10 percent lived in Kodiak prior to the project. If we assume that this project is typical of state generated activity, the consumer spending impact is only one-quarter of total spending. The share of Kodiak employees will be smaller with larger projects or at peak periods of projects.

TABLE 102

Terror Lake-Resident Employment

Kodiak Usual Residence	26.5%
Kodiak Future Residence	10.3%
Kodiak Previous Residence	10.4%
Dependents Previous Residence	11.1%
Dependents Current Residence	27.78%

SOURCE: Alaska Power Authority, Terror Lake Workers Survey, computer printouts.

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Government and the Communities. Table 103 shows the government employment in the region's communities. Included are jobs in sectors where the government is the most likely source of funds. Because census figures are often suspect, the 1980 figures are compared to public sector jobs found in 1983 in a survey sponsored by the state's Department of Community and Regional Affairs. As can be easily seen, all communities are significantly dependent on government employment. No community has fewer than 30 percent of their employment in government activity, while in six communities government supported employment is over 60 percent of the total.

Table 103

Community Government Employment

	1980[1]	1983[2]
Karluk	21 (75%)	16
Akhiok	13 (72%)	11
Ouzinkie	20 (47%)	19
Port Lions	41 (54%)	44
Old Harbor	29 (66%)	34
Larsen Bay	24 (51%)	18
Chignik	22 (32%)	11
Chignik Lake	23 (100%)	24
Chignik Lagoon	5 (45%)	4
Perryville	9 (75%)	12
Ivanof Bay	9 (100%)	5
Cold Bay	125 (86%)	100

[1] 1980 Census tapes; includes construction, public administration, professional, transportation, education, and communication and public utilities. In Cold Bay transportation employees are excluded.

[2] Alaska Dept. of Community and Regional Affairs, Community Profiles, 1983.

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SUMMARY: EXTERNAL SECTOR

Table 104 summarizes the employment structure of the Kodiak external sector. This includes both the external production and government sectors; that part of economic activity which is influenced outside of the region is in the external sector of the economy. The sector has grown over our study period; if we abstract from the change in the military, civilian employment has increased by 80 percent. Although fishing is important, its relative importance has declined slightly over the period from 61 percent of the civilian base in 1970 to 57 percent in 1983. Government employment has become a more important source of external change over the period, with state government's role increasing rapidly in the late 70s. Increased government activity balanced the down turn which occurred in the fishery. The increasing importance of government is especially pronounced in the small communities.

TABLE 104

External Sector Employment

	Fishing		Visitor	Government				
	Harvesting	Processing	Industry	Military	Direct	Transfer	Construction	Total
1970	726[1]	701	92	1,491	558	273	---	3,841
1975	747	1,108	136	877	467	336	89	3,760
1980	1,327	1,544	202	1,098	494	526	---	5,191
1983	1,129	1,285	255	1,095	526	642	402	5,334

[1] Based on change in total Kodiak gear operators 1970-1975.

SOURCE: Tables 5-21.

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The impact of a change in the employment composition of the external sector is not necessarily proportional to the impact on the economy. External sector industries differ in the extent of leakage from the economy and the incomes workers earn. The role of government is reinforced because direct and transfer employees have relatively high incomes and few leakages. This contrasts with fish processing, construction, and military employment which all have significant leakages.

THE LOCAL SUPPORT SECTOR

In small regional economies, the primary source of economic change is changes in demand for products produced in the region. The last three sections described those sectors affected by changes in external demand. In this section we describe the level and patterns of change in that sector of the economy in which the level of activity is determined by local demand. The industries which make up the support sector provide goods and services to local residents and businesses. Change in this sector is a function of resident population and income growth.

There are a number of ways the support sector in a region can be isolated. The major problem is that any one industry sells goods and services both inside and outside the region. The most reliable method is the survey approach which isolates by questionnaire the proportions of sales in each industry that are internal and external to the region. In this study the support sector industries are isolated by definition; the support sector is made up of industries which typically provide a large portion of their output locally. Later the portion of these industries that serve external sources of demand are excluded. As before, the regional economy is described first, followed by a description of the individual community or village economies.

Table 105 shows the pattern of change for the Kodiak region in those industries that are traditionally defined as the support sector. This sector expanded throughout the study period. The most rapid expansion occurred between 1975 and 1980 when support sector employment increased at an annual average rate of 7.2 percent per year. While this was only slightly faster than the previous five year period (6.6% per year), it was almost three times as fast as the post-1980 period (2.3% per year between 1980 and 1983). The first two are periods of relatively rapid increases in fisheries income, while the final one coincides with the decline in fishery income.

As Table 105 shows, the expansion of all industries within this sector did not occur at the same rate. The non-proportional industry expansion can be explained in a number of ways. First, changes in technology affect employment in different industries differently. Industry output may expand without expanding employment if labor saving technology is incorporated in its production. Second, the expansion of local economies is not a smooth process. A support sector industry may expand faster or slower than the rest of the economy. Expansion depends on the existence of entrepreneurs willing to invest in the sector and on their perception of future economic growth. If entrepreneurs' perceptions about growth are wrong, they may expand faster or slower than other sectors. Third, differences may result from changes in the approach to number keeping. For example, altering the definition of an industry by the Dept. of Labor may result in major shifts in employment figures. Finally, the non-proportional growth may be the result of structural change--a change in the relationships between sectors or the economy (see Huskey, 1982, for an explanation of the process). One of the most important sources of structural change is the beginning of local production of goods and services that were either previously imported or not purchased locally because of high cost. The primary determinant of structural change is the expansion of local markets. As the local market expands it becomes cheaper to produce goods and services locally.

Table 105 shows that the Kodiak support sector has expanded along with the external sectors of the economy. The rapid expansion of the Kodiak market suggests structural change has most likely occurred in Kodiak. Structural change is suggested by comparing the growth rates of the support sector and total nonagricultural wage and salary employment. Throughout the period, this sector expands more rapidly than total employment. Only in the period after 1980 does the support sector expand in close to proportion with the total economy.

Table 106 examines the pattern of support sector growth in Kodiak over the study period; industries are ranked by period growth rates. Three characteristics of the pattern of change are evident. First, as just discussed, support sector employment expanded more rapidly than total employment, suggesting that structural change has been important. Total support sector employment increased at an annual average rate of 6.2 percent per year, while total nonagricultural wage and salary employment only increased at a rate of 4.8 percent a year.[5] Support sector employment increased from 30 percent to 36 percent of total employment over the period.

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[5] Total nonagricultural wage and salary employment is our proxy for total economic activity.

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TABLE 105

Support Sector Employment
Kodiak

Industry*	1970	1975	1980	1983	Annual Average Growth Rate 70-83	75-83	70-83
Transportation							
Water	14	16	19	34	7.1	9.9	21.4
Air	53	87	84	68	1.9	--	--
Other	104	68	130	99	--	4.8	--
Communications & Utilities	45	48	119	110	7.1	10.9	--
Wholesale Trade	12	32	20	37	9.0	15.1	22.7
Retail							
Food	48	66	117	153	9.3	11.1	9.4
Eating & Drinking	120	147	168	228	5.1	5.6	10.7
Bldg Materials	15	64	99	46	9.0	--	--
Other	151	174	192	259	4.2	5.1	10.5
Finance							
Banking & Credit Agencies	38	39	38	49	2.0	2.9	8.8
Insurance	6	11	10	10	4.0	--	--
Real Estate, Holding & Other	5	40	51	44	18.2	1.2	--
Service							
Hotels	29	82	48	63	6.1	--	9.5
Business	11	18	47	40	10.4	10.5	--
Personal	7	10	16	12	4.2	2.3	--
Repair	7	19	41	38	13.9	9.1	--
Amusement**	15	13	16	10	--	--	--
Legal	2	2	9	13	15.5	26.4	13.0
Health	63	84	146	185	8.6	10.4	8.2
Social Service & Other**	55	137	242	249	12.3	5.9	1.0
Support Sector	800	1,104	1,612	1,747	6.2	5.9	2.7
Total Nonagricultural Wage & Salary Employment	2,662	3,777	4,464	4,880	4.8	3.3	3.0

* Certain sectors are estimated. Rates of decline in employment are not shown.

** Amusement includes movies; social services includes membership, miscellaneous, education and museums.

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The second characteristic is that the composition of the support sector changed over the period; industries within the support sector grew at different rates. By examining industry specific growth we can isolate the changing composition. The five most rapidly growing industries were services; the most dramatic change in share was Social Services which increased from almost 7 percent to over 14 percent of total support sector employment. Three trade industries grew faster than the total (food, building materials, and wholesale); food sales increased its share of support sector employment from 6 percent to almost 9 percent. Transportation dominated the slow growth industries with Air and Other Transport share falling from almost 20 percent to under 7 percent of support sector employment, while Water Transport maintained its share at slightly less than 2 percent.

Finally, Table 106 shows that the pattern of economic adjustment in small regions is not smooth. Expansion over the whole period did not guarantee continual expansion throughout the study period. This table compares growth over the whole period to growth after 1980. There are only three industries that grew at their 1980-83 rate over the whole period (Legal, Food, and Health). Five of the eleven industries which grew faster than the support sector as a whole between 1970-1983 lost employment after 1980. Four industries (Wholesale Trade, Water Transport, Eating and Drinking, and Other Retail) grew at rates during 1980-83 that were over twice as fast as for the entire study period. One-half of the industries that grew slower than the support sector over the entire period grew faster than the support sector between 1980 and 1983. The decline in some industries after 1980 may be partially a response to declines in fishing incomes after 1978. A more important reason may be the pattern of entrepreneurial perceptions; some industries may have expanded too rapidly and the post-1980 period was one where competitive pressures or reevaluation of the market led to a cutback. Other industries may have underestimated growth earlier in the period and revised their expectations upward.

Manufacturing that serves the local economy is often ignored in the analysis of the support sector. Table 107 is provided to show that certain parts of the manufacturing industry which support local activity also experienced rapid growth. This data is from the U.S. Census which, in the case of manufacturing, provides a more detailed industry structure. Of these industries only printing and publishing serve the local population while the others serve the fishing industry. Three of these industries grew faster than total nonagricultural wage and salary employment between 1970 and 1980.

Village Support Sector. Table 108 describes the composition of the village support sector in the region. The most obvious characteristic is its relative underdevelopment. Except for Cold Bay, no village has more than 15 employees in this sector. The reason for this is the small markets in each community; Old Harbor, the largest village, has only slightly more than three hundred people. Cold Bay differs because of its outpost-enclave nature; much of the support sector activity serves a broader external market. Comparing the 1970 and 1980 census suggests that the development

TABLE 106

Industry Ranking by Growth Rate
(Kodiak)
1970-1983

		Share of Support Sector (%)		
Industry	Annual Percentage Growth Rate 1970-83	1970	1983	Annual Average Growth Rate 1980-83
Real Estate, etc.	18.2	.63	2.52	13.0
Legal	15.5	.25	.74	13.0
Repair	13.9	.88	2.18	--
Social Svcs.	12.3	6.88	14.25	1.0
Business Svc.	10.4	.14	2.29	--
Food	9.3	6.00	8.76	9.4
Bldg Materials	9.0	1.88	2.63	--
Wholesale Trade	9.0	1.50	2.12	22.7
Health	8.6	7.88	10.59	8.2
Communications & Utilities	7.1	5.63	6.30	--
Water Transport	7.1	1.75	1.95	21.4
Total Support Sector	6.2	100	100	2.7
Hotels	6.1	3.63	3.61	9.5
Eating & Drinking	5.1	15.00	13.05	10.7
Total Employment	4.8	332.75	279.34	3.0
Other Retail	4.2	18.88	14.83	10.5
Personal Service	4.2	.88	.69	--
Insurance	4.0	.75	.57	--
Banking, etc.	2.0	4.75	2.80	8.8
Air Transport	1.9	6.63	3.89	--
Other Transport	--	13.00	5.67	--

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of these sectors is a relatively recent phenomenon, since only three communities had employees in these sectors in 1970. This expansion is a response to increased money incomes, as well as increased state spending and village corporation activity.

THE LOCAL SUPPORT SECTOR RESPONSE TO EXTERNAL CHANGES

The external and local support sectors of the Kodiak regional economy do not exist independently of each other. The interrelationships between the two determine the overall level of economic activity in the region. The linkage between the local and external sectors of a regional economy describes the local support sector's response to externally induced economic changes. By examining this linkage in the past, we can increase our understanding of the potential economic consequences of OCS development.

TABLE 107

Support Sector Manufacturing
Kodiak

Industry	1970	1980	Average Annual Growth Rate
Printing & Publishing	17	45	10.2
Machinery	4	16	14.9
Electrical Machinery	0	4	--
Transportation Equipment	15	15	0

SOURCE: U.S. Department of Commerce. Bureau of the Census, 1970 & 1980 Census of Population.

TABLE 108

Village Support Sector
1980

	Transportation	Communications Public Utilities	Trade	Finance Business Repair	Non-Educ. Professional Service
Ouzinkie	0	0	7	0	3
Port Lions	0	3	4	0	7
Old Harbor	2	[3]*	1	0	4
Larsen Bay	[3]	2	4	0	3
Karluk	0	0	0	3	3
Akhiok	2	0	3	0	0
Perryville	0	2	3	0	0
Ivanoff Bay	0	0	[2]	0	2
Chignik Lake	0	0	0	0	3
Chignik Lagoon	2	0	0	0	2
Chignik	0	0	3	0	4
Cold Bay	20	17	0	0	25

* Numbers in brackets are from 1982 Community Profiles (Alaska Department of Community and Regional Affairs). These are used when significantly different from census.

SOURCE: U.S. Department of Commerce, Bureau of the Census, 1980 Census Tapes

The local and external sectors of the economy are interrelated in two important ways. First, the level of activity in the local support sector may determine what external activities occur in the region. External sector industries can only sell goods and services outside the region if they can produce the product cheaper than competitor regions. Goods and services available in the local sector influence the cost of doing business and the region's competitive position (Tussing et al, 1981). A second more direct relation concerns the determinants of the level of activity in the local sector. In small regions, the level of local sector activity is determined by the activity in the external sector. The only reason local sector activity exists is to serve the population and industries of the basic sector. Because of this relation, the level of basic sector activity is the most important determinant of local sector activity. It is this second linkage that describes the local response to external change.

The relationship between the two is described by a multiplier. The multiplier describes how much total support sector economic activity is created by an initial injection of income into the economy because of purchases in the external sector. Additional income and employment is created through the re-spending of the income injected from outside the region. The size of the multiplier depends on how fast the money leaks out of the regional economy; leakages occur as payments to factors outside and as purchases of goods and services from outside the region.

Table 109 presents two simple estimates of the multiplier, each showing how a change in external sector activity alters support or local sector activity. The employment multiplier shows how an increase of one external sector employee increases employment in the local support sector. For example, in 1982 increased employment of 100 in the external sector would have increased the local support sector by 54 employees. The income multiplier estimates the support sector employment created by $1 million in external sector wages. In 1982 an increase in external sector income of $1 million would have increased local support sector employment by 15; assuming $20,000 as an average wage, 100 external sector employees would create 30 local support sector jobs. The numbers in Table 109 are only crude approximations of the local sector response to changes in the external sector. However, these crude estimates can be used to point out important characteristics of the multiplier relationship.

We can observe from Table 109 that the income and employment multipliers differ and that both multipliers generally increase with an increase in overall economic activity. Each of these observations supports an earlier observation that simple multiplier relations derived from a single year are not useful tools for estimating the impact of future changes in the external sector (Huskey, 1980). Investigating the reasons for these observations may help in developing more useful multiplier relations.

Several reasons can account for the observed instability of the multiplier

TABLE 109

Multiplier--Local Economic Response
Kodiak

	Support Sector Employment	External Sector Employment	Kodiak Real Personal Income	Employment Multiplier	Income Multiplier
1970	800[1]	2,815[2]	94.7[3]	.284	8.45
1975	1,104	2,786	120.10	.396	9.19
1980	1,612	3,516	133.70	.458	12.06
1982	1,675	3,099	148.60	.540	11.27

[1] Includes industries in support sector as defined in Table 105.
[2] Includes construction, manufacturing, state and federal government, and military employment. This does not include fish harvesting employment.
[3] Millions of real (1980) dollars by place of work from BEA Local Area Personal Income.

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over units and across time:

1) Measurement differences. Employment and income multipliers in Table 109 treat fish harvesting employment differently. The employment multiplier ignores the fish harvesting sector.

2) Nonearned income. The income multiplier accounts for the effect of transfer income on local sector activity. The employment multiplier ignores transfers and overestimates the response to external changes.

3) Income distribution. Changes over time may reflect changes in the distribution of income. How much income individuals earn influences how much they spend and what they spend it on; as incomes in the external sector become more evenly distributed the multiplier will increase. In addition, the employment multiplier will change as the incomes of external sector employees change. The income composition of the external sector employment is important for determining the overall multiplier.

4) Nonresident component. An important leakage from a regional economy is income earned by nonresident employees. If the resident share of external sector employment increases, the simple ratios of Table 109 will increase because more is spent locally.

5) Structural change. As the market in a region grows, more types of activities become profitable. This structural change reduces the leakages from the local economy since there are more goods and services to purchase locally. The effect of this structural change is to increase the multiplier.

6) Nonlocal demand. A simple definitional disaggregation of employment into external and local support industries may misplace employment. Most important in this case are activities placed in the support sector that are really determined by external demand. Certain trade and service employment serves a nonlocal market; as this component grows the simple multiplier will increase.

In order to develop an appropriate mulitplier we must account for these factors. Of them, the most important are income leakages and the direct impact of external industries on the support sector. In the following discussion we calculate the resident-income multiplier, which accounts for major problems with the simple multiplier. This multiplier could be used to project the effect of an increase in resident income, if there were not structural change. The estimated multipliers are used to estimate the historic importance of structural change; then the potential for future change is examined.

Table 110 describes the direct leakages of income from the economy. The table provides an estimate of the income of residents. Income generated in the region in any industry leaks from the region as payment to factors from outside the region; in Kodiak's case the most important factor is labor. Payments to nonresident labor reduced Kodiak income by between 18 percent and 12 percent over the period. As Kodiak grows we would expect the Kodiak income leakage to decline.[6]

TABLE 110

Kodiak Resident Income
(thousand of 1980 dollars)

	Earnings by Place of Work	Earnings by Place of Residence[1]	Income by Place of Residence[2]
1970	90,408	$ 77,428 (86%)	$ 84,959
1975	106,671	90,142 (85%)	108,564
1978	129,681	106.920 (82%)	124,259
1980	119,717	105,032 (88%)	125,542
1982	124,859	108,899 (87%)	139,537

[1] Net of earnings by nonresidents and contributions to social insurance.
[2] Includes transfers plus dividends, interest, and rent.

SOURCE: U.S. Dept. of Commerce, Bureau of Economic Analysis, Local Area Personal Income, various years.

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The support sector grows as residents purchase more products locally and as more local businesses purchase goods and services directly. Table 111 estimates support sector activity. By factoring out estimates of industry employment serving directly external sectors, we find the resident income sensitive portion of the support sector. The Kodiak resident demand is estimated to account for 70 percent of the activity in these industries. The major components of direct external demand are the visitor industry and sales of food to canneries and fishing boats.

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[6] This data probably underestimates income leakage since nonresident fishermen and crew earnings are most likely not reported in Kodiak.

TABLE 111

Local Resident Support Employment[1]

	1980			1975		
	Population	Tourism[2]	Fishing & Other	Population	Tourism[2]	Fishing & Other
Printing	45			28		
Machinery			20			10
Transp. Equip. Mfg.			15			15
Water Transp.	19			16		
Air Transp.	61	23		71	16	
Other Transp.	121	9		62	6	
Communications & Utilities	119			48		
Wholesale Trade	20			32		
Food	75	9	33[3]	42	6	18[3]
Eating & Drinking	113	55		110	37	
Bldg. Materials	99			64		
Other Retail	149	43		145	29	
Banking & Credit Agencies	38			39		
Insurance	10			11		
Real Estate, Holding, Other	51			40		
Hotels	--	48		*	34	
Business Service	47			18		
Personal Service	12	4		7	3	
Repair	37	4		16	3	
Amusement	13	3		11	2	
Legal	9			2		
Health	73		73	42		42
Social, etc.	65		177	70		67

[1] Based on census employment estimates and proportionate growth.

[2] Employment is assumed to grow in proportion to real visitor expenditures (see Table 95).

[3] Interview with store managers in Kodiak--proportion of sales to canneries and boats.

The information in Tables 110 and 111 allow us to calculate an income multiplier which accounts for most of the problems described earlier. The multiplier shows the potential long run effect of a million dollar increase in the income of residents. This multiplier would be useful for forecasting since it accounts both for leakages and only measures the population impact (excludes the effect of direct industry purchases which must be separately accounted). However, this multiplier ignores the importance of structural change in small economies. Because of this, the multiplier can be used only under the assumption of no structural change.

The income multiplier is found using the following set of equations:

1) $E_s = bY$

2) $Y = W_s \times E_s + W_b \times E_b + T$

3) $E_s = b\,(W_s \times E_s + W_b \times E_b + T)$

4) $E_s \times (1 - bW_s) = b\,(W_b \times E_b + T)$

5) $E_s = \frac{b}{1-bW_s} \times (W_b \times E_b + T)$

Where E_s = support sector employment

E_b = resident external sector employment

W_s = support sector wage

W_b = external sector wage

T = transfers

b = support sector-income ratio

In addition, income must be adjusted for non-income leakages. In the Kodiak case, this includes payments to Coast Guard base residents of $2,940,000 in 1980 and $2,348,000 in 1975. The income multiplier shown in Table 112 is calculated as $(m = b/(1-bW_s))$.

The multiplier increased from 9.75 to 11.78 over the period 1975 to 1980.[7] Using the 1980 multiplier we would forecast an increase of 12 support sector employees for each million dollar increase in resident basic sector income; this differs only slightly from the gross multiplier in Table 109. The problem with using this formula is the evidence of structural change

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[7] The 1975 and 1980 period were selected to examine the multiplier on each side of the rapid increase in the fishery earnings. A purpose of this discussion is to examine how the multiplier responds to non-marginal change in the economy.

TABLE 112

Local Resident Income Multipliers
Kodiak

	Support Sector Employment per Million Dollars of Resident Income (b)	Income[1] Multiplier (m)
1975	8.2	9.75
1980	9.6	11.78

[1] Assumes support sector wage rate of $19,300 in 1980 and $19,400 in 1975 (in 1980 dollars)

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and its effect on the multiplier. As the economy grows the support sector may expand proportionately as suggested by the multiplier in Table 112. However, the support sector will also expand as new activities become possible in Kodiak; the multiplier ignores this change.

To understand the potential consequences of structural change on the multiplier, we must look at the leakage from the local economy. Structural change can be thought of as reducing the leakage through purchases. Table 113 provides one way of estimating the consumption leakage from the Kodiak economy. This table compares local expenditures on retail goods and services. If we adjust U.S. per capita purchases to reflect differences in prices between Kodiak and the U.S. average and assume Kodiak residents consumption is the same as U.S. residents, we can estimate the consumption leakage. On a per capita basis 17 percent of direct retail purchases and 55 percent of direct service expenditures occur outside the region. This overestimates the leakage since differences in relative prices and location specific tastes will change consumption, but it suggests one important source of leakage occurs on the first round of expenditure. As Kodiak grows this leakage will be reduced, resulting in an increase in the multiplier. If this leakage was completely eliminated (and employment per dollar of expenditure stayed constant), the Kodiak multiplier could increase by almost 20 percent. The pattern of multiplier change would also depend on changes in local manufacturing.

Local Support Sector Response in the Communities

The effect of a change in the external sector of a local economy will depend on two linkages. First, the linkage between the local and external sectors within a community economy can be described by a multiplier type relation. Second, villages in the region may effect each other's economy as they purchase goods and services in other areas. These spatial links are strongest within the region for the Kodiak Island villages.

TABLE 113

Source of Leakage
Kodiak, 1977

	Local Spending			
	Per Dollar Resident Income		Per Capita	
	U.S.	Kodiak	U.S.[1]	Kodiak
Retail	.470	.458	4,932	4,087
Service	.117	.061	1,224	545

[1] Translates U.S. spending to Kodiak prices using U.S. and Anchorage CPI and assuming Kodiak is 10 percent more expensive than Anchorage.

SOURCE: U.S. Dept. of Commerce, Bureau of the Census, Census of Business-Retail Trade, Service, 1977.

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As previously mentioned, the villages in the region have small populations, which complicates any discussion of the support sector. Table 114 shows that in general the traditional employment multiplier lies in the range of .2 - .3 support sector employees for each basic sector employee. The income ratio which forms the basis for the income multiplier seems high; five communities have ratios higher than the Kodiak region. The range of the income ratios is wider than the employment multiplier with low income villages having larger ratios.

There are a number of explanations for this pattern. First, data problems in small areas may reduce the validity of our findings. Secondly, these are support sector jobs which are not necessarily equivalent. Data show people with jobs, not full-time equivalent employment. In some villages these jobs may be part-time; in this case two half-time jobs would provide equivalent service as one full-time job. Third, our definition of support sector is quite broad, and many of the jobs may not be supported by local incomes but by external transfers. This is especially true of the employment categories of communication, public utilities, and professional services. This explains the high ratios found for Cold Bay. Fourth, high ratios are found in villages with limited fishing income or opportunities. This may suggest that opportunity costs influence employment; support sector employment would be higher the fewer the alternatives. Fifth, the growth of the support sector may follow a pattern which decreases the per capita employment over a certain range. As support businesses achieve economies of scale they can serve larger communities with the same level of employment. Finally, high income ratios for poor places suggest that poor rural residents rely more importantly on the local store while richer residents can shop at regional centers.

Spatial linkages are also important, particularly in the Kodiak subregion. Discussions with food stores in Kodiak city suggest that approximately 10 percent of their sales are in the Bush, although a portion of this occurs through direct sales by Kodiak-owned stores located in the villages. The link between communities would also affect transportation services.

TABLE 114

Village Support Sector Linkage

	Support Sector Employment[1]	SSE/Basic Employment	SSE/ Income[2]	SSE/ Population
Ouzinkie	10	.303	5.4	.058
Port Lions	14	.226	8.0	.065
Old Harbor	10	.270	7.6	.029
Larsen Bay	12	.226	9.4	.071
Karluk	6	.273	23.2	.063
Akhiok	5	.385	17.2	.048
Perryville	5	.714	7.2	.045
Ivanoff Bay	4	.571	19.2	.100
Chignik Lake	3	.150	5.5	.022
Chignik Lagoon	4	.571	9.0	.083
Chignik	7	.117	4.8	.039
Cold Bay	63	.759	15.1	.276

[1] See Table 108.
[2] Millions of 1980 dollars.

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SUMMARY: SUPPORT SECTOR

When rural economies with strong resource production bases are analyzed, the focus is usually on the resource sector. Past growth and the potential for future growth are usually defined in terms of the resource sector. We have shown in this section that the local support sector cannot be ignored or assumed to expand proportionately as the external sector expands. The local support sector may be a source of growth on its own through structural change and its feedback effect on the cost of doing business. The potential for structural change is great as small communities grow. This complicates our ability to use historical patterns of change to forecast the future. We have shown that the multiplier relation changes with growth, making it an unreliable projecting tool.

THE HOUSEHOLD SECTOR

The household sector forms the core of the regional economy. The decision of firms to buy the resources owned by the households determines the flow of income into the region; the most important resource owned by the region's population is its labor. Households' decisions about how to spend their income determines the growth of the local support sector; the more they spend on goods and services produced locally the greater the local effect. The importance of this sector to policy makers is underscored by our examination of unemployment, which measures the inability of residents to sell their labor resources.

The household's important consumption function was previously examined in the discussion of the link between income and local support sector employment. We turn next to the growth of this sector and its links with the production sector. This linkage can be described in terms of households' participation in the production sector and the importance of payments to the households for this participation.

Table 115 describes the growth of the population between 1970 and 1980. This period coincided with the rapid increase in economic activity for the region. Population expansion during this period was concentrated in Kodiak city and the surrounding area. Between 1970 and 1980 the Kodiak city non-base urban area expanded by 60 percent; growth in non-base population was 1,500 in excess of the decline in the base population.

TABLE 115

Community Population Growth

	1960	1970	1980
Kodiak City	2,628	3,798	5,432
Kodiak City, Urban Area		1,543	3,101
Coast Guard Station	--	3,052	1,370
Akhiok	84	115	105
Karluk	129	98	96
Larsen Bay	72	126	168
Old Harbor	193	290	340
Ouzinkie	214	160	173
Port Lions	--	227	215
Chignik	99	83	178
Chignik Lagoon	108	--	48
Chignik Lake	107	117	138
Ivanoff Bay	--	48	40
Perryville	111	94	111
Cold Bay	86	256	228

SOURCE: Alaska Department of Labor, Alaska Population Overview, 1983. The village figures in 1980 are census figures. The State disagrees with the census and estimates Kodiak population 1,061 higher. We assume this occurs mostly in Kodiak city and surrounding urban area and have allocated it accordingly.

The population of the region increasingly concentrated in Kodiak city during the period. Only Chignik grew at a rate greater than the Kodiak city urban area. Four communities grew greater than 15 percent over the period. Five communities lost population. This increased concentration occurs even though jobs generally increased throughout the region (see Table 84). The main reason for this is that the villages in 1970 had surplus labor (unemployed workers) or surplus labor was created by the aging of the population into working age. We can see the difference in Table 116, which compares 1980 census employment figures to 1970 population. These numbers provide only an indication since census employment numbers are inexact (most importantly underestimating fishing). However, surplus labor is indicated by the fact that in over half of the villages 1980 employment was less than 30 percent of 1970 population. This suggests new job opportunities could be filled from the existing population, requiring no adjustment through in-migration or allowing out-migration even with new local jobs.

The pattern of population change is shown in Table 117; population change in a community is composed of natural increase (births minus deaths) and net migration (in- minus out-migration). Net in-migration occurred in only three communities, Kodiak, Larsen Bay, and Chignik. Net in-migration is one response to expanding economic opportunities. These three communities had relatively low levels of surplus labor according to our measure in Table 116.

TABLE 116

Surplus Labor
(Selected Communities)

	(1) Population 1970	(2) Employment 1980	(2)/(1)
Kodiak City	5,341	4,080	.764
Larsen Bay	126	49	.389
Old Harbor	290	44	.152
Ouzinkie	160	43	.269
Port Lions	227	76	.335
Chignik	83	67	.807
Chignik Lake	117	23	.197
Perryville	94	12	.128
Ivanof Bay	48	9	.188

SOURCE: See Table 84.

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Even if communities do not grow in absolute size, they may change qualitatively. This qualitative change may occur even if the total population remains constant; this may happen through either the replacement effect of migration or the net effects of births and deaths. The replacement effect of migration occurs when in-migrants do not look like out-migrants; this effect may occur even where net migration is zero. Table 118 illustrates

TABLE 117

Components of Population Change by Community 1970-1980

	Births	Deaths	Net-Migration	% 1970
Karluk	34	15	-21	-21.4
Akhiok	31	7	-34	-29.6
Ouzinkie	43	12	-18	-11.3
Port Lions	51	24	-39	-17.2
Kodiak 'City'	1,861	393	1,724*	32.3
Larsen Bay	31	13	24	19.0
Old Harbor	92	33	-9	-3.1
Chignik Lake	24	2	-1	-.9
Perryville	30	6	-7	-7.4
Chignik	19	4	80	96.4

* Adjusted for non-city urban population growth.

SOURCE: T. Lane and W. Nebesky, The Effects of State Expenditures on Rural Population Settlement, ISER, 1982.

changes in two important qualitative dimensions of population, race and age composition. The racial composition seems to have changed significantly in only two communities; over the period Larsen Bay and Chignik both decreased the share of population which is Alaska Native. These two communities also experienced positive net migration. The movement of non-Natives to these communities to take advantage of increased economic opportunities represents one adjustment of the household sector to economic change.

Another qualitative dimension of the population which may be reflect economic change is the age distribution. If migration is an adjustment mechanism to economic changes, we would expect the working age population to be influenced. Table 118 compares the proportion of the population between 18 and 64 years old, which is the working age cohort. We would expect this cohort to increase with increased economic opportunities. Working age component of the population increased in all but one village, Karluk. Karluk experienced significant income decline between 1970 and 1980, which does not conflict with our hypothesis. In general, expanding working age proportions can be explained in three ways. First, villages in general experienced improved economic opportunities during the period. Second, the age distribution of the population is 1980 reflects its age distribution in 1970; villages with a large proportion of population between 8 and 54 in 1970 will have a large proportion in working age independent of migration. Finally, a reduction in the birth rates between 1970 and 1980 will reduce the proportion of children in the population and increase the working age proportion.

TABLE 118

Population Composition

	% Native		% Population 18-64	
	1970	1980	1970	1980
Karluk	96.9	100.0	58.2	51.0
Akhiok	98.3	96.2	40.0	58.1
Ouzinkie	89.4	94.2	54.4	59.5
Port Lions	78.0	75.3	49.3	56.7
Old Harbor	92.8	92.9	42.1	56.4
Kodiak	14.8	15.6	60.1	68.0
Larsen Bay	83.5	72.0	41.3	50.0
Chignik	80.7	53.4	48.2	69.7
Chignik Lake	98.3	90.6	37.6	55.1
Chignik Lagoon	--	85.4	--	60.4
Perryville	95.7	92.8	51.1	52.3
Ivanoff Bay	--	92.5	--	45.0
Cold Bay	--	4.4	--	--

SOURCE: U.S. Dept. of Commerce, Bureau of the Census, 1980 and 1970 Census Tapes.

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Even though net migration may not increase population, population churning through migration will result in qualitative changes. Table 119 illustrates the interregional connection through migration and how that changed through the study period. Migration was an important phenomena in all communities. The villages in the region had a much greater share of in-migrant population in 1980 than in 1970. This reflects both net additions to the population through in-migration, as well as replacement of out-migrants. This second component of change is the churning of the population. Given the low levels of overall growth, this table shows considerable churning between 1975 and 1980. The pattern of migration from outside the region was similar for Kodiak city in the 1960s and 1970s. For eight of the villages the share of residents from outside the region increased in 1980. One reason for this may be the type of jobs created. If residents want work but can't take the type of jobs available, people from other regions may come to take the jobs.

Household and Production Sector Linkage. The most important link between the household and production sectors of an economy is through the sale of labor resources. This not only determines the level of employment in an economy, but also the level of income. This section describes this linkage in terms of the local labor force participation and incomes earned throughout the region.

TABLE 119

Community In-migration[1]

	Residents Outside of Region[2] during the year 1965	1975
Kodiak City	1,337 (35%)	1,791 (38%)
Karluk	0	9 (13%)
Akhiok	0	0
Ouzinkie	10 (5%)	19 (12%)
Port Lions	72 (33%)	55 (27%)
Old Harbor	15 (6%)	33 (10%)
Larsen Bay	26 (32%)	33 (24%)
Chignik	0	74 (67%)
Chignik Lake	17 (28%)	38 (48%)
Chignik Lagoon	0	4 (11%)
Perryville	0	13 (14%)
Ivanoff Bay	0	4 (7%)
Cold Bay	93 (67%)	191 (85%)

[1] Location of residents who were over five years old in 1970 and 1980.
[2] Region is the census division where the community is located.

SOURCE: U.S. Dept. of Commerce, Bureau of the Census, 1980 Census Tapes.

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Table 120 describes the labor force participation rate of the population over 16 in 1979; this shows the proportion of the population over 16 which was in the labor force at any time (and for any amount of time) in 1979. The rates are determined by a number of factors. The most important are the age distribution and employment opportunities in the community. Labor force participation rates will be lower the greater the proportion of population of school age (16-18) and over 65. In small communities labor force participation depends on the availability of jobs; if no jobs are available people will not spend much time searching for jobs and so drop out of the labor force.

Using statewide rates for comparison, two sets of communities can be defined--those with labor force participation rates greater than and less than statewide averages. Five communities have greater male rates and two have greater female rates. Both rates are higher than state averages in Kodiak city and Chignik. One explanation for these two may be the relatively high share of population in the 18-64 age group (see Table 118). Cold Bay is close to being in this group. Cold Bay's enclave nature would suggest that every adult there is a worker.

TABLE 120

Community Labor Force
Participation
1980

	% of Population over 16 which participated in 1979	
	Male	Female
Kodiak City	94.4	77.1
Akhiok	94.3	67.7
Karluk	65.2	40.0
Larsen Bay	97.2	44.4
Old Harbor	76.6	34.1
Ouzinkie	85.7	45.5
Port Lions	87.1	--
Chignik	100.0	90.2
Chignik Lagoon	76.9	62.5
Chignik Lake	72.7	65.4
Ivanoff Bay	73.5	44.4
Perryville	80.0	23.3
Cold Bay	100.0	70.1
Alaska	90.2	71.2
Urban	91.8	74.2
Rural	87.5	65.0

SOURCE: U.S. Dept. of Commerce, Bureau of Census, 1980 Census Tapes

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Compared to other rural areas of the state, communities in the study region evidence a relatively high participation in the market economy. Table 121 suggests that this pattern is historically important in the region. We can see that the Kodiak census division had slightly higher rates of participation than the state in both 1970 and 1980. This is true for all groups in both periods except Native females in 1980.

Although the region experiences greater participation in the labor force than the rest of the state, the pattern of this participation is quite different from the state and especially the state's urban areas (see Table 122). In the state's urban areas, 74 percent of the men and 62 percent of the women work full time (greater than 40 weeks). Only Cold Bay replicates this pattern; Kodiak city is close, with 64 percent of men and 46 percent of women working full time. In six communities less than 20 percent of the men who work, work full time; there are five communities where this is true of women also. In seven communities the majority of men work less than one-half of the year. The explanations for these patterns are unclear. Some contend that participation in subsistence activities limits an individual's ability to work in the market. There may be a limit to the

TABLE 121

Labor Force Status
(share of population 16 years or older)

	1970		1980	
	Alaska	Kodiak	Alaska	Kodiak
Total				
Male	84.8	89.8	81.7	85.1
Female	46.2	51.9	59.7	60.2
Rural				
Male	79.7	80.5	74.0	83.0
Female	40.9	44.5	51.1	51.3
Native				
Male	50.9	--	54.7	61.2
Female	31.0	--	43.1	35.2

SOURCE: U.S. Dept. of Commerce, Bureau of the Census, General Social and Economic Characteristics--Alaska, 1970 and 1980.

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TABLE 122

Pattern of Labor Force Participation
1979

	Male			Female		
	Share Working (in weeks)			Share Working (in weeks)		
	40-52	27-39	1-26	40-52	27-39	1-26
Alaska	67.7	9.2	23.2	56.6	13.1	30.3
Alaska Urban	73.9	8.2	17.9	61.7	12.3	26.0
Kodiak Region	65.5	11.8	22.7	44.4	19.0	36.7
Kodiak City	63.6	12.9	23.5	45.9	20.0	34.1
Akhiok	0	18.2	81.8	0	24.0	76.0
Karluk	54.5	9.1	36.4	0	20.0	80.0
Larsen Bay	39.7	19.0	41.3	18.8	18.8	62.5
Old Harbor	33.7	12.0	54.2	37.0	22.2	40.7
Ouzinkie	5.5	30.9	63.6	0	33.3	66.6
Port Lions	58.1	17.6	24.3	20.9	16.3	62.8
Chignik	54.8	23.8	21.4	47.8	17.4	34.8
Chignik Lagoon	20.0	0	80.0	85.7	14.3	0
Chignik Lake	6.3	9.4	84.3	17.6	35.3	47.1
Ivanof Bay	0	0	100.0	28.6	0	71.4
Perryville	0	0	100.0	0	85.7	14.3
Cold Bay	78.9	9.2	11.9	64.3	0	35.7

SOURCE: U.S. Dept. of Commerce, Bureau of the Census, Census of Population, 1980, Tapes.

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availability of jobs; residents may not have the skills or consider the social costs too great to take them. According to the 1980 Census, 9.2 percent of the Kodiak Native population worked outside their region of residence. Finally, residents may limit their market participation because they have limited needs for additional income.

Participation in the labor market is the main source of cash income for residents in any economy. Table 123 shows that while earnings for selling labor has consistently provided the major source of income in the region, non-labor income has become increasingly important, rising from 8.8 percent in 1970 to 21.9 percent in 1982. The role of government in the region has been discussed; the increasing importance of transfer payments in the income stream (11.0 percent in 1982) is another example of this phenomenon.

TABLE 123

Source of Income
Kodiak Area
(thousands of 1980 dollars)

	Earnings	Dividend, Interest, Rent	Transfers	Total
1970	77,428 (91.1%)	3,695 (4.3%)	3,836 (4.5%)	84,959
1975	90,142 (83.0%)	6,532 (6.0%)	11,889 (11.0%)	108,563
1980	105,032 (83.7%)	11,769 (9.4%)	8,741 (7.0%)	125,542
1982	108,898 (78.0%)	15,253 (10.9%)	15,385 (11.0%)	139,536

SOURCE: U.S. Dept. of Economic Analysis, Local Personal Income, various years

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Table 124 illustrates the characteristics of Kodiak area census division income and compares them to the state as a whole and over time. Over the period 1970 to 1980 Alaska total and rural income distributions have become more skewed with the share of population above $50,000 and below $10,000 increasing. This pattern also occurred in rural Kodiak but not in Kodiak city; the share of population in both extreme income groups fell in Kodiak city over the period. Natives living in the region seem to have the most skewed income distribution with over 50 percent of households in these two extreme income categories.

In all cases, per capita incomes rose over the period, reflecting declining household size, increased labor market participation, and improved standards of living. While for the state real median household incomes stayed constant over the period, Kodiak real median incomes increased from $23,000 to $26,400. This increase reflected increases in Kodiak city since rural

TABLE 124

Kodiak Income Characteristics

	Household Income*						Per Capita Income		% of Households* with Government Transfer Income			
	% greater than $50,000		%less than $10,000		Median				SSI		Public Assistance	
	1970	1980	1970	1980	1970	1980	1970	1980	1970	1980	1970	1980
Alaska	10.0	15.7	14.0	18.3	$25,498	$25,414	$ 7,715	$10,193	5.5	6.9	4.9	3.7
Rural	8.2	13.3	16.6	24.5	25,197	22,343	7,032	8,765	6.8	7.8	6.9	3.7
Kodiak	27.0	17.6	15.1	17.6	$22,881	$26,421	$ 6,877	$10,415	5.6	8.0	4.7	6.0
Kodiak City	33.0	21.0	18.8	13.4	26,340	30,512	8,348	12,030	5.4	9.2	2.7	5.0
Kodiak Rural	6.0	14.0	10.4	22.0	22,326	21,645	7,020	8,932	--	--	--	--
Kodiak Native	--	12.7	--	38.1	--	16,635	--	6,719	--	16.5	--	18.4

* 1970 numbers, except for per capita income, are for families, not households. Incomes in 1970 adjusted to 1980 dollars.

SOURCE: U.S. Dept. of Commerce, Bureau of the Census, Characteristics of the Population: General Social and Economic Characteristics: Alaska, 1970 and 1980.

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real median household incomes on Kodiak as well as at the state level fell. Native households in the Kodiak region have relative low incomes; real median income is $10,000 less than the average for the area in 1980.

Finally, Table 124 shows the increased importance of government transfer incomes in the Kodiak area. In 1980, 8 percent of the households received some form of social security income (SSI) and 6 percent received some form of public assistance. In both cases this was an increase since 1970. While the share of households receiving SSI increased at the state level, public assistance declined. The most transfer-reliant group is Natives where over 15 percent of the households receive either SSI and/or Public Assistance in 1980.

Table 125 shows the same information for communities in the study region. This shows the wide diversity of communities; median household incomes range from $7,000 in Old Harbor to $31,000 in Cold Bay. Median income is less than $10,000 in four communities and greater than $25,000 in four communities. Income distribution seemed skewed in Old Harbor, Ouzinkie, and Port Lions. Six communities have over one-half of the households with incomes less than $10,000. Transfers are important in most communities; four communities seem exceptionally reliant with over 20 percent of the households receiving either SSI or Public Assistance.

TABLE 125

Community Income
1980

	Household Income (1980)			% of Households with Government Transfer Income	
	% Greater than $50,000	% less than $10,000	Median	SSI	Pub.Assist
Kodiak City	21.0	13.4	$30,512	9.2	5.0
Akhiok	0	65.0	9,063	3.8	3.8
Karluk	0	58.8	8,125	5.9	5.9
Larsen Bay	0	18.4	17,000	50.0	28.9
Old Harbor	4.2	56.1	7,062	3.2	12.6
Ouzinkie	13.0	29.6	18,750	22.0	18.5
Port Lions	10.7	32.0	17,813	25.3	28.0
Chignik	21.3	6.4	25,208	0	6.4
Chignik Lagoon	25.0	8.3	27,500	0	16.6
Chignik Lake	0	57.1	4,375	0	0
Ivanof Bay	0	73.3	9,125	0	53.3
Perryville	0	50.0	11,250	0	10.0
Cold Bay	0	22.2	31,111	0	0

SOURCE: U.S. Dept. of Commerce, Bureau of the Census, 1980 Census Tapes.

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SUMMARY: HOUSEHOLD SECTOR

The Kodiak region has been one of relatively high market interaction. The population continues to experience a high participation in the market. The pattern of participation is different from the pattern found in most urban areas, because a large share of the region's population works less than full time. Two factors are important in explaining this--the importance of seasonal, relatively high income fishery opportunities and limited job opportunities.

The household sector has experienced migration as an adjustment to expanding economic opportunities. In-migrants have led to significant change in the qualitative character of many communities. In only three communities has in-migration resulted in net population gain. One reason for in-migrants replacing out-migrants may be an imbalance between the skills of residents and those required for new jobs.

Incomes have changed slightly in the region. This reflects rapid increase in incomes in Kodiak city; real median income in the rural parts of Kodiak fell slightly. Kodiak Natives, who make up the majority of rural residents, have relatively low incomes; their median incomes are almost half the median in Kodiak city. The region has a wide disparity in household median incomes across the communities; median incomes range from $4,375 in Chignik Lake to $31,000 in Cold Bay.

A final observation is the increased importance of government transfers. Eight percent of Kodiak households receive some form of social security income, while 6 percent receive some form of public assistance. These shares have increased since 1970. The pattern of transfer income varies across communities, but is substantial in some communities. This is one more way government is becoming a more important component of the regional economy. Public sector effects are fully explored in the next chapter.

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V. THE PUBLIC SECTOR OF THE KODIAK/SHUMAGIN REGIONAL ECONOMY

by Dona K. Lehr, Ph.D.

Introduction

Public sector expenditures and activities are a crucial element in the Kodiak/Shumagin regional economy. State, federal, and local government operations, employment, transfer payments, and other actions directly and indirectly influence its size and composition. The effects are pervasive and difficult to gauge precisely. In this chapter, the major aspects of the economic impact of government are described, and the extent of government influence is roughly estimated. A discussion of the implications for the region over time is not possible in this volume.

In particular, the increase in state revenues derived from oil development has resulted in major capital construction projects, increased direct state provision of services, increased state grants to non-profit organizations and local governments, as well as direct cash transfers and reduced taxes for individuals in the study area and across the state. To understand the basic economic structure and relationships within the region, it is necessary to delineate government's role in the area. Further, the future of the regional economy is closely tied to the future of the public sector. We need a firm grasp on what government currently provides in order to analyze the potential impact of a change in that role.

State revenues from public ownership and taxation of petroleum resources are declining. These declining revenues are yielding concomitant changes in state expenditures. How important will such declines be to the Kodiak/Shumagin region? Although the largest potential reductions exist in state expenditures, federal and local spending may decline as well. Current budgetary debates at the federal level call into question expenditures on programs ranging from mass transit, to nutritional programs, to social security and federal revenue sharing; so it appears that the federal government will, over the next few years, either reduce expenditures and/or increase taxes. Since local governments depend heavily upon state and federal revenues, their expenditures will decline as well. Communities will then be faced with demands to replace lost federal and state services, as well as maintain their more traditional activities. However communities respond to these pressures, one option is increasing local taxes. Such taxes likewise affect the level at which the economy operates.

It is difficult to clearly distinguish among state, federal, and local government expenditures. A substantial portion of local government budgets is financed through intergovernmental receipts (i.e., monies received from the state and federal governments). For example, in their study Alaska's Urban and Rural Governments, Morehouse, et al. estimated that in FY 1981 state revenues comprised 40 percent of general revenues of selected home-rule and first-class cities, while federal revenues added another 6 percent (Morehouse, et al. 1984:90). Five years earlier these figures were 20 percent and 10 percent, respectively. Similarly, federal grants in aid comprise between 6 and 7 percent of total state general revenues for FY84 and FY85 (Alaska Department of Revenue 1985).

While the source of funds is not always specified in the analysis which follows, we have attempted to avoid double counting. Fund source is noted wherever it is felt to be helpful to understanding of public sector impact. The discussion is organized according to governmental level (spending agent). State expenditures are dealt with in the greatest detail given their importance and likelihood of change. This is followed by local expenditures, and finally federal government activities in the study area.

Expenditures are broadly categorized as operating and capital; operating expenditures are further delineated (where data are available) into personal services, grants, transfer payments, and indirect expenditures. Each section begins with a discussion of data for the Kodiak region. Where possible, this is followed by presentation of detail for the Kodiak Island villages, Alaska Peninsula villages, and Cold Bay. Since the level of detail is not consistent throughout, summary data is at the broad level of operating, capital and indirect expenditures. Data sources and problems are discussed in each section of the report.

State Expenditures

Comprehensive data on the distribution of state expenditures by location are not available. Neither expenditure records nor appropriations are routinely designated by place. In this study we try to identify expenditures or appropriations that are specifically directed to occur in the area in question. We do not attempt to estimate, for example, what proportion of central office efforts might be made in behalf of each area (e.g., how much time Department of Education Juneau office staff might spend administering that portion of the Foundation Program which funds the Kodiak Island Borough School District).

In February 1982 the Research Agency of the Alaska State Legislature House of Representatives (hereafter called House Research), prepared a study which broke down fiscal years 1981 and 1982 operating and capital budgets by election districts. House Research was able to allocate about two-thirds of the operating budget for those two years, and over 80 percent of the capital budget. Table 126 below shows the amounts allocated to the Kodiak election districts. Election District 14, often referred to simply as Kodiak, contains urban Kodiak and Ouzinkie. District 15--Aleutian Islands/ Kodiak (Rural)--includes the remaining Kodiak villages, East Alaska Peninsula villages (including the Chigniks, Perryville, Ivanof Bay) and the Aleutians (including Cold Bay). Reapportionment resulted in a new District 27--Kodiak/East Peninsula--which contains all of Kodiak (urban and rural) plus the East Alaska Peninsula villages of interest to this study. Cold Bay is contained in a new District 26, Bristol Bay/Aleutian Islands. Data from FY83 forward is presented according to these new districts. See Figure 13 for a map showing these changes.

TABLE 126

Capital and Operating Budget Partial Allocation

A. Kodiak (Urban) Election District 14

	FY81	FY82
Allocated Expenditures ($000)		
Operating Budget	$26,127.6	$33,138.4
Capital Budget	12,503.0	97,652.0
Loan Programs	10,886.1	4,656.4
Total Allocated	$49,516.7	$135,446.8
Per Capita Allocation ($)		
Kodiak	$ 5,655	$15,467
Statewide Average	6,156	7,738
Unallocated (statewide)	1,316	1,532

B. Aleutian Islands/Kodiak (Rural) Election District 15

	FY81	FY82
Allocated Expenditures ($000)		
Operating Budget	$13,370.9	$18,179.3
Capital Budget	22,635.3	40,721.9
Loan Programs	2,158.9	140.7
Total Allocated	$38,165.1	$59,041.9
Per Capita Allocation		
Aleutian Islands/Kodiak (Rural)	$4,029	$6,233
Statewide Average	6,156	7,738
Unallocated (statewide)	1,316	1,532

SOURCE: House Research Agency, State of Alaska, Report 82-48, Analysis of Election District Appropriations, February 25, 1982.

According to this allocation by House Research, in FY 1981 the Kodiak (Urban)--Election District 14--was the recipient of per capita appropriations which totaled about 92 percent of the statewide average. In FY 1982, however, the per capita budgeted amounts were well in excess of average--double the average per capita amount. This wide swing in relative position results from the distortions introduced by the appropriation in one year for large capital projects, which are of a one-time nature and for which expenditures actually occur over several years. The FY 1982 budget included $71.5 million for the Alaska Power Authority project funding for the Terror Lake Hydroelectric Project. The share of the operating budget on a per capita basis appears more stable for Kodiak (Urban) at 97 percent of the statewide average in FY 1981 and 96 percent in FY 1982.

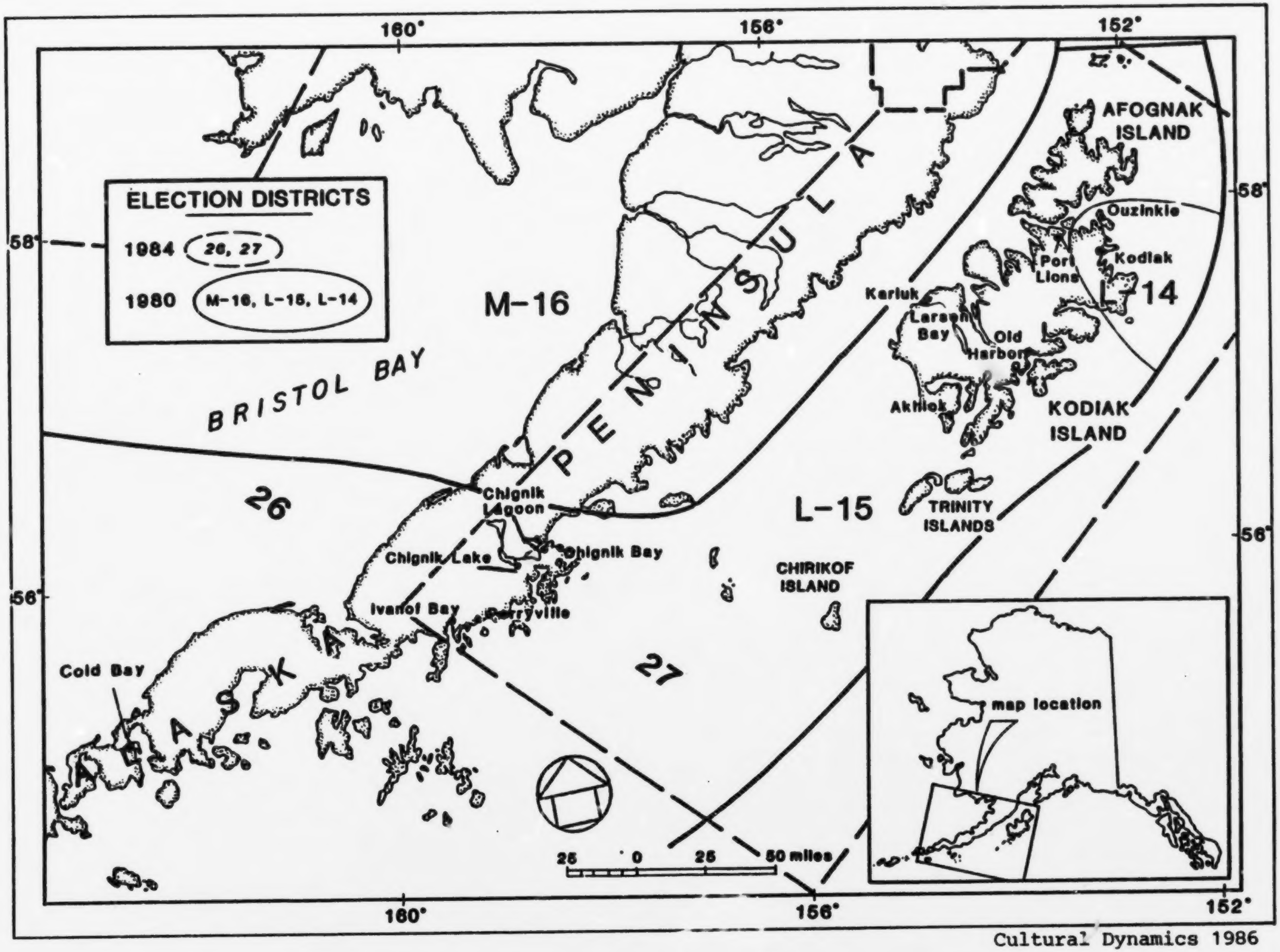
160°
156°
152°
58°
56°
ELECTION DISTRICTS
1984 26, 27
1980 M-16, L-15, L-14
M-16
BRISTOL BAY
26
27
L-15
L-14
PENINSULA
ALASKA
AFOGNAK ISLAND
Ouzinkie
Port Lions
Kodiak
Karluk
Larsen Bay
Old Harbor
Akhiok
KODIAK ISLAND
TRINITY ISLANDS
CHIRIKOF ISLAND
Chignik Lagoon
Chignik Lake
Chignik Bay
Ivanof Bay
Perryville
Cold Bay
map location
25 0 25 50 miles

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FIGURE 13 250

ELECTION DISTRICT BOUNDARIES AS REAPPORTIONED IN 1980 and 1984

The rural portions of the study area as represented in Election District 15 received a lower percentage of the statewide average of allocated appropriations--65.4 percent in FY81 and 80 percent in FY82. The share of operating expenditures allocated to this area is even lower, 45.8 percent of the average per capita level in FY81 and 48.8 percent in FY82. Since this election district contains a larger area than is included in this study, Table 126 does not give a precise measure of the per capita level for the study region. Although these data are subject to limitations, they offer a starting point for our more detailed analysis of state activity.

STATE OPERATING EXPENDITURES

The operating budget represents the ongoing expenses of state government. About one-third of operating expenditures is for personal services; that is, wages, salaries and benefits of state employees. Thus a significant portion of state impact on a particular area relates to the number of employees and payroll in that area. Another important portion of the operating budget is grants and claims to local governments and non-profit organizations. A conservative estimate by the State Office of Management and Budget of operating appropriations that pass through state agencies to municipal governments and other local entities was 38.2 percent of unrestricted general funds for FY85.

A third category of state operational spending of importance is direct cash transfers to individuals. These transfer payments include family assistance payments, Permanent Fund Dividends, and the Longevity Bonus payments. These three categories of expenditures--personal services, grants to local entities, and transfer payments to individuals--receive the most attention in our analysis. Other operating expenditures such as commodity purchases, rents and leases, travel, and so on are included when known.

Personal Services

According to the Appropriated Personnel Budget Report (APBR) produced by the Division of Legislative Finance, as of February 1983 there were 216 state positions in Election District 27 (Kodiak-East Alaska Peninsula). Although University of Alaska positions are excluded from the APBR, University budget documents indicate 32 positions in FY83, for a total of 248 state jobs. With the exception of three fish culturists at Kitoi Bay, the location given for these jobs was Kodiak Island. Annual salaries at that time totaled over $8.5 million, or about $713,800 per month. State employment in Cold Bay in FY83 was 18 positions, with an annual payroll of nearly $625 thousand. Table 127 gives more detail, showing the number of employees by department for FY 1983 and FY 1985.

TABLE 127

A. Kodiak Island--State Positions by Agency

Agency	FY 1983[1] Number	FY 1983[1] Annual Payroll ($000)	FY 1985[2] Number
Administration	--	--	3
Education	1)	376.8	2
Health & Social Svcs	11)		12
Environmental Conserv.	3	100.4	2
Fish and Game	101	3,154.6	119
Labor	6	184.2	7
Law	4	134.0	4
Natural Resources	2	49.6	5
Public Safety	51	1,881.8	52
Transportation and Public Facilities	19	626.5	22
Court System	13	374.3	12
Legislature[3]	5	124.9	3
University of Alaska[4]	32	1,558.5	40
Total	248	8,565.6	283

B. Cold Bay--State Positions by Agency

FY 1983[1]

Agency	Number	Annual Payroll ($000)
Fish and Game	9	339.6
Health and Social Svcs	1	42.9
Transportation and Public Facilities	6	194.0
Court System	2	48.3
Total	18	624.8

SOURCES:

1. Appropriated Personnel Budget Report, Legislative Finance Division, February 1983.
2. Estimate by Department of Administration, January 1985.
3. Includes legislators. FY 85 data, 1 full-time (non-elected) position, but have funds for hiring part-time help as needed. Personal services budget for local services, approximately $76,000 in FY 85.
4. University of Alaska, FY'83, Working Budget. FY 85 positions--estimate based on FY 85 personal services budget.

NOTE: Position information for members of the National Guard is not included. These numbers are somewhat lower than those used by the Department of Labor. Temporary positions are excluded from these numbers.

Although current payroll figures were not available, a rough estimate was derived by assuming that the average wage level increased by 4 percent a year since the beginning of 1983, and applying that average level to the increased number of positions in 1985. The 4 percent increase is assumed to include merit increases of workers who remained in the same positions over this period. Using this technique state annual payroll on Kodiak Island would be approximately $10.6 million in 1985. These payroll figures do not include employee benefits which are included in the personal services category of agency budgets, and which add over 25 percent to personnel costs.

More detailed information on the operational expenses of several agencies was obtained by contacting each department. The dollar figures given are estimates by departmental personnel since in most cases records are not kept by location. The Department of Fish and Game is the largest state employer in the Kodiak region. Table 128 summarizes budgeted expenditures by division and expenditure type for FY 85. The Department of Public Safety is the second largest with 52 employees in FY 85; Table 129 summarizes their operating expenditures for FY84 in the Kodiak area. Public Safety services for the villages are provided through the Village Public Safety Officer (VPSO) program, which is administered in this area through the Kodiak Area Native Association and Bristol Bay Native Association. For example, KANA received $142.3 thousand for this purpose in FFY84, $137.0 in FFY83, and $107.8 thousand in FFY82.

Kodiak Community College and the Fishery Industrial Technology Center are part of the University of Alaska system of higher education serving the study region. Table 130 shows expenditure levels of these units since FY83. While KCC expenditures have grown at about 5 percent a year over this period, the Fisheries Industrial Technology Center, which was established in 1981, had a large growth spurt between FY84 and FY85. This growth reflected an influx of federal funds that jumped from $30.3 thousand in FY84 to $411 thousand in FY85. The FY86 budget request for this program included $426 thousand in federal funds. The focus of the Center is development of "microbiologically sound processing and handling techniques for Alaska seafoods and formlating and developing handling techniques for seafood products" (Univ. of Alaska 1984:16). The legislative intent in the initiation of the program was in part to enhance Alaska's competitive position in world seafood markets.

The Department of Transportation and Public Facilities is the fourth largest in terms of employment in the Kodiak region. A breakdown of operating expenditures was not available since the programs are administered regionally. The district including Bristol Bay, Iliamna, Kodiak, and the Aleutian Chain has an FY85 budget in excess of $4 million. Although total expenditures were not available, we did obtain village contract amounts for snow removal from local airfields. Contract amounts are given in Table 131. Grading of runways and roads is done by district personnel (mechanic/operator) who fly into a community from Kodiak city or King Salmon. Also, quarterly inspections are made of airport runways, access roads, and buildings. A maintenance station with 13 people is located in the town of Kodiak; another in Cold Bay, with 6 employees.

TABLE 128

Department of Fish and Game
Kodiak and Vicinity--Budgeted Expenditures
FY85 ($000)

Division	Personal Services	Travel	Contracts	Commod-ities	Equip-ment	Total
Commercial Fisheries:						
Kodiak	2,476.5	45.7	497.9	185.8	46.3	3,252.2
Kodiak Vicinity	882.5	73.4	184.0	96.9	38.1	1,274.9
Vessels Section	213.9	1.0	30.0	131.1	16.2	392.2
Administration	107.1	1.9	50.0	4.5	1.5	165.0
Commercial Fish. Entry Comm.	39.6					39.6
Fisheries Redev. & Enhancement						
Kodiak	70.7	2.0	10.5	2.0	---	85.2
Kodiak Vicinity	620.0	25.0	211.1	177.0	14.5	1,047.6
Sport Fisheries	125.2	2.1	11.4	1.8	---	140.5
Game	168.8	9.1	94.4	11.6	---	283.9
Total	4,704.3	160.2	1,089.3	610.7	116.6	6,681.1

SOURCE: Alaska Department of Fish and Game.

Cultural Dynamics

TABLE 129

Public Safety Budgeted Expenditues
FY84 ($000)

	Personal Services	Travel	Contract Services	Commod-ties	Equip-ment
Public Safety					
Fish & Wildlife	799.0*	24.0	32.3	25.9	---
Enforcement	1,652.9	63.7	319.0	413.6	6.0
State Troopers	541.8		Operating	291.7	
Total	2,993.7		Other Operating	1,176.2	

*Estimate reflects exclusion of employees outside the area. Data shows $1,010,300 for 24 permanent employees, 6 outside the Kodiak area; $72,114 for 7 seasonal, 3 outside of Kodiak area.

SOURCE: Department of Public Safety.

Cultural Dynamics

TABLE 130

University of Alaska
Kodiak Expenditures ($000)

	Personal Services	Travel	Other	Total
Kodiak CC				
FY83	1,653.7	94.1	503.8	2,251.6
FY84	1,784.0	69.2	543.3	2,396.5
FY85	1,853.6	75.6	553.9	2,483.1
Fisheries Industrial Technology Center				
FY83	205.6	48.6	117.3	371.5
FY84	215.2	54.3	190.5	460.0
FY85	926.2	127.8	147.2	1,201.2

SOURCE: University of Alaska, Statewide Budget Office, Budget Development Analysis Printouts, January 1985.

Cultural Dynamics 1986

TABLE 131

Village Contracts--DOTPF
(Principally Airport Snow Removal)

Location	Amount ($) FY84	FY85	Recipient
Akhiok	2,500	---	Individual
Karluk	3,600	4,000	IRA Council
Larsen Bay	4,000	4,400	Individual
Old Harbor	2,750	2,750	Old Harbor Council
Ouzinkie	3,900	4,135	City of Ouzinkie
Port Lions	16,000	16,000	City of Port Lions
Chignik Bay	5,000	5,700	Individual
Chignik Lagoon	3,500	3,700	Individual
Chignik Lake	3,500	3,700	Individual
Perryville	4,500	5,000	Individual

SOURCE: Department of Transportation and Public Facilities.

Cultural Dynamics 1986

Additional detail was obtained on the operation of a few of the state agencies with a smaller level of activity in the area. These are presented in Table 132. Although in some cases this detail information is sketchy, estimates of the operating budgets for agencies representing slightly over 85 percent of direct state employment in the Kodiak area were developed here through individual agency contacts. These findings are summarized in Table 133. Omissions from Table 133 are the Department of Transportation and Public Facilities (8 percent of direct state employment); and the Departments of Administration, Education, Environmental Conservation, Law, Natural Resources, and the Legislature (together totaling less than 7 percent of direct state employment in the region).

TABLE 132

Other State Operating Expenditures
Kodiak Area ($000)

Agency	Personal Svcs (FY85)	Program Support (FY85)	Total FY84	Total FY85
Health & Social Svcs	458.0	135.0*	582.0	593.0
Court System	460.0	155.0	597.6	615.0
Labor (Employment Center)	200.0*	73.4	260.4	273.4*
Total	1,118.0	363.4	1,440.0	1,481.4

*Estimates

SOURCE: Departments of Labor and Health and Social Services, Court System.

Cultural Dynamics 1986

TABLE 133

Summary of Agency Operating Budgets FY85
($000)

Agency	Personal Services	Other	Total
Fish & Game	4,704.3	1,976.8	6,681.1
Public Safety	3,143.4	1,235.0	4,378.4
University of Alaska	2,779.8	904.5	3,684.3
Other	1,118.0	363.4	1,481.4
Total	11,745.5	4,479.7	16,225.2

NOTE: Adjustments were made to put all figures in FY85. "Other" includes travel, contractural, commodities, and equipment.

Cultural Dynamics 1986

Grants

The second major component of state expenditures investigated here is grants to local governments and other local entities. Primary grants to local governments include revenue sharing, municipal assistance, miscellaneous shared taxes, school foundation programs, and other school support. For fiscal year 1985, these aid categories comprised 35 percent of the state's total general fund operating budget, and 93 percent of state appropriations for grants to municipalities and other local entities.

Revenue Sharing. State revenue sharing provides financial aid to municipalities, Native village governments, and volunteer fire departments located outside cities and boroughs. Entitlements for municipalities are computed according to an established equalization formula that considers population, taxable wealth, and tax effort. Additionally, payments are made for certain municipal services such as roads and health facilities. Minimum entitlement for municipalities is $25,000 plus a cost of living adjustment, while Native village governments have an entitlement of $25,000. These entitlements are, however, contingent upon legislative appropriations and have been less than $25,000 in recent years. Table 134 shows the amounts allocated to the Kodiak region for the fiscal years 1979-1984. Karluk, an unincorporated village within the Kodiak Island Borough, received a minimum entitlement in FY 1981. Subsequently, the statutes authorizing this program were interpreted to exclude villages within boroughs from eligible Native village governments, and so Karluk has received no further direct payments.

Municipal Assistance. The municipal assistance program is a sharing of corporate income tax revenues with incorporated areas of the state. Alaska Statute 43.20.016 provides for 30 percent of corporate income taxes (petroleum and other) to be allocated to municipalities. The distribution of these revenues among communities is determined by their relative shares of gross receipts taxes collected in 1978 and current population. As with other formula programs, the amount distributed is ultimately determined by the legislative appropriation for this purpose. These amounts are provided in Table 135.

Shared Taxes. Other shared taxes include amusement and gaming taxes, aviation fuel tax, electric and telephone co-op tax, alcohol license tax, and raw fish tax. As can be seen in Table 136, with the exception of the raw fish tax, these revenues are relatively small. Chignik Bay is the only incorporated East Alaska Peninsula community covered in this study. Shared tax payments began in FY84, with $235,308 received from the Raw Fish Tax. Access to these funds was an important consideration in the decision to incorporate.

The importance of these three categories of state aid to municipalities--revenue sharing, municipal assistance, and shared taxes--is obvious when their dollar value is compared to total local revenues. For example, this aid comprised over 38 percent of the borough's total revenues in FY 1984; for the City of Kodiak, they appear to comprise about 35 percent of revenues exclusive of interfund charges.

TABLE 134

State Revenue Sharing ($000)
Kodiak-Shumagin Region

	Fiscal Year					
	1979	1980	1981	1982	1983	1984
Kodiak Island Borough	$194.5	$235.4	$562.6	$801.5	$1017.2	$932.2
Kodiak City	193.9	218.5	470.4	555.2	919.3	926.4
(2nd Class Cities)						
Akhiok	1.1	8.1	25.4	19.9	*	16.4
Larsen Bay	--	1.8	25.4	26.0	25.9	24.1
Old Harbor	15.8	18.9	26.0	26.4	26.2	24.5
Ouzinkie	3.1	3.9	25.4	26.3	26.1	24.4
Port Lions	10.5	11.8	25.7	26.3	26.1	24.5
Sub-total	$418.9	$498.4	$1160.9	$1481.6	$2040.8	$1972.5
Chignik	--		25.0	23.2	20.0	29.0
Chignik Lagoon	--	--	25.0	23.2	20.0	22.4
Chignik Lake	--	1.1**	25.0	23.2	20.0	21.0
Ivanof Bay	--		25.0	23.2	20.0	21.0
Perryville	--	1.0**	25.0	23.2	20.0	21.0
Sub-total		2.1	125.0	116.0	100.0	114.4
Cold Bay	--	--	--	--	31.1	29.5
Total	418.9	500.5	1,285.9	1,597.6	2,171.9	2,116.4

* Missing from report.
** Volunteer Fire Department

SOURCE: Department of Community and Regional Affairs, State of Alaska

TABLE 135

Municipal Assistance Payments by Community ($000)

	Fiscal Year				
	1980	1981	1982	1983	1984
Kodiak Island Borough	35.1	563.4	793.3	797.4	720.3
Kodiak City	180.3	756.5	1,095.2	956.6	891.6
Akhiok		10.8	20.7	14.5	12.8
Larsen Bay		16.3	32.9	24.6	21.6
Old Harbor		35.4	66.2	48.9	45.1
Ouzinkie		18.6	33.9	32.2	28.0
Port Lions		24.3	41.9	40.1	35.3
Subtotal Villages		105.4	195.6	161.3	142.8
Total - all Kodiak Island		1,425.3	2,084.1	1,915.3	1,754.7
Chignik (Incorporated in 1983)	---	---	---	---	15.2

SOURCES:
1. Kodiak Island Borough, Financial Statements 1981 and 1982, Kodiak Island Borough (descriptive brochure) 1983.
2. City of Kodiak, Combined Financial Statements, Fiscal Years 1980, 1981, 1983, 1984. Peat, Marwick, Mitchell & Co.
3. Dept. of Revenue, State of Alaska, phone contact (FY83-84)
4. Department of Revenue, worksheets, FY 81, FY 82 (villages).

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TABLE 136

State Shared Taxes ($000)

	Kodiak Island Borough		Kodiak City		Port Lions	
	FY83	FY84	FY83	FY84	FY83	FY84
Amusement & Gaming Tax	.3	.3	1.6	.9	--	--
Aviation Fuel	--	--	3.5	3.7	--	--
Electric, Telephone Co-Op	9.2	5.5	19.5	20.7	--	--
Liquor License	--	--	26.9	22.4	--	--
Raw Fish Tax	884.0	709.7	585.4	559.8	10.5	--
Totals	893.5	$715.5	$636.9	$607.5	10.5	0

SOURCE: Department of Revenue, State of Alaska (phone contact). FY85 figures were not available. Larsen Bay received approximately $26,000 in FY85.

Cultural Dynamics 1986

__State Aid to Local Schools.__ About one third of the total state operating budget is devoted to funding education. This aid provides close to 100 percent of the financial support for rural districts (called Rural Education Attendance Areas) and over 80 percent of the operating revenues of organized districts. The Kodiak Island Borough School District operates 12 elementary schools (including one serving the Coast Guard Support Center) and 6 secondary schools. They are located in Akhiok, Chiniak, Karluk, Larsen Bay, Old Harbor, Ouzinkie, and Port Lions, as well as at five locations in the city. Enrollment was 2,252 in FY84.

The school district is a major employer, with a total of 337.35 (full-time equivalent) positions authorized in the FY 85 budget. The schools are often the largest employer in the villages. Table 137 summarizes general fund revenues by source for the Kodiak Island Borough School District. For FY 1985 the district's budget is $15,963,063, with salaries of $10,294,009 and $2,253,534 for employee benefits. While enrollment has grown at an annual average rate of less than 1 percent between 1976 and 1984, revenues grew at a rate of 14.3 percent, or 7.4 percent when adjusted to reflect inflation. Table 138 summarizes school district employment for FY80-84.

TABLE 137

Kodiak Island Borough School District
General Fund Revenue by Source
($000)

FY	Local	State	Federal	Total
75	$424.6 (9.3%)	$3,987.9 (87.5%)	$144.7 (3.2%)	$4,557.2
76	588.8 (11.8%)	4,311.6 (86.2%)	99.5 (2.0%)	4,999.9
77	725.3 (12.6%)	4,987.6 (86.4%)	59.9 (1.0%)	5,772.8
78	646.9 (10.4%)	5,325.9 (85.5%)	253.7 (4.1%)	6,226.6
79	877.4 (11.7%)	6,284.7 (83.6%)	351.1 (4.7%)	7,513.1
80	1,117.4 (12.8%)	7,250.3 (82.7%)	396.5 (4.5%)	8,257.9
81	1,173.2 (11.4%)	8,578.6 (83.6%)	506.1 (4.9%)	10,257.9
82	685.2 (5.8%)	10,520.7 (89.7%)	524.2 (4.5%)	11,730.0
83	1,315.8 (9.2%)	12,463.7 (87.2%)	515.0 (3.6%)	14,294.5
84	1,489.6 (10.2%)	12,779.0 (87.5%)	342.3 (2.3%)	14,610.9
85	1,406.9 (9.2%)	13,611.4 (88.6%)	350.0 (2.3%)	15,368.3

SOURCE: Kodiak Island Borough School District, Statistical Data, Last Ten Fiscal Years (FY 1975-1984), prepared by the Business Department, September 1984; Kodiak Island Borough School District, approved budget FY 1984-85.

TABLE 138

Kodiak Island Borough School District
Authorized Positions by Category
Last Five Years

Employee Category	Fiscal Year 1980	1981	1982	1983	1984
Administration	14	13	12	10	10
Principals	9	9	9	9	10
Teachers	150	150	150	153	156
Technical	7	8	8	7	7
Clerical and teacher aides	97	93	92	94	87
Maintenance/warehouse	17	18	19	17	19
Custodial	29	36	35	35	35
Food Service	8	10	7	6	6
Total authorized positions	331	337	332	331	330

SOURCE: Kodiak Island Borough School District, Statistical Data, Last Ten Fiscal Years (FY 1975-1984), prepared by the Business Department, September 1984.

Cultural Dynamics 1986

Budget documents for FY85 indicate that 25.1 percent of expenditures (over $4 million) will be allocated to village schools, while the remaining 74.9 percent (close to $12 million) goes to schools in town (Kodiak). Many expenditures are budgeted district-wide or village-wide and cannot be easily allocated to specific villages. Table 139 below shows the distribution by village of those expenditures which are formally budgeted by place.

TABLE 139

Village Specific School Expenditures
($000)

Place	FY81	FY82	FY83	Revised FY84	Approved FY85
Akhiok	$ 85.2	$ 85.4	$ 104.2	$ 114.6	$ 161.9
Chiniak	52.0	74.3	100.3	188.5*	127.7
Karluk	66.6	75.9	90.5	128.2	145.9
Larsen Bay	96.7	121.4	204.5	266.3	312.8
Old Harbor	301.3	405.1	470.4	492.8	474.1
Ouzinkie	125.3	173.5	227.8	221.8	236.7
Port Lions	204.0	263.2	373.9	404.0	433.1
Village-wide Services	463.9	388.6	289.7	276.1	246.1

*Includes a one-time expenditure of $80.0 for instructional equipment.

SOURCE: Kodiak Island Borough School District, approved budget, FY 1984-1985

Cultural Dynamics 1986

These figures show the distribution of only slightly over 50 percent of the expenses allocated to villages, but do give some perspective on the relative size among village schools. Village enrollment is projected at 412 for FY85; Kodiak enrollment at 1,894. Table 140 shows authorized positions by type in village schools for FY 1985.

TABLE 140

Authorized Positions--Village Schools
Kodiak Island Borough School District
FY85 Budget

	Instruction[1]		Support[2]		
Site/Program	Classified	Certified	Classified	Admin.	Total
Akhiok	.5	3.0	.3	--	3.8
Chiniak	1.7	2.0	.3	--	4.0
Karluk	1.5	2.5	.3	--	4.3
Larsen Bay	1.0	4.75	.4	.5	6.65
Old Harbor	2.3	8.5	.6	.6	12.0
Ouzinkie	1.3	3.5	.2	.5	5.5
Port Lions	1.5	6.9	.5	.6	9.5
Village Area Office			1.5	1.0	2.5

[1] Instruction includes regular instruction, special education, and vocational instruction.

[2] This does not include 58.5 employees budgeted for operations and maintenance district-wide.

SOURCE: Kodiak Island Borough School District document, September 1984.

Cultural Dynamics 1986

Other major elements of state funding of local schools involve direct capital appropriations for school construction and renovation, and debt retirement of locally financed school construction. These items are discussed along with other capital expenditures in a later section. Other expenditures that are directed toward education such as student loans, Kodiak Community College, and teachers' retirement are also discussed elsewhere.

The Alaska Peninsula villages are included in the Lakes and Peninsula Rural Education Attendance Area. Although expenditures by location are not available, state aid of $14,157 per student, and federal aid of approximately $3,217 per student was received by the REAA in FY85 ($13,905 and $2,617, respectively in FY 84). Enrollment for FY82-85 and positions for FY85 are given in Tables 141 and 142.

TABLE 141

School Enrollments
East Alaska Peninsula Villages

Location	FY82	FY83	FY84	FY85
Chignik	26	24	25	18
Chignik Lagoon	9	15	17	16
Chignik Lake	46	45	45	42
Ivanof Bay	7	6	8	9
Perryville	41	38	40	38
Total	129	128	135	123

SOURCE: Lakes and Peninsula REAA. Cultural Dynamics 1986

TABLE 142

East Alaska Peninsula
School Employment

Location	FY85 Full-time Equivalents Instruction	FY85 Full-time Equivalents Support	Number of Jobs (PT and FT)
Chignik	3.375	1.125*	8
Chignik Lagoon	3.0	.625	5
Chignik Lake	6.25	2.625*	13
Ivanof Bay	1.0	.5	2
Perryville	5.0	2.563	10
	18.625	7.438	38

Instruction includes principals/teachers, teachers, preschool aides.
Support includes other aides (e.g., library aides), secretaries, cooks, and custodians.

* Does not include recreation aides who watch gym when in community use--numbers vary.

SOURCE: Lakes and Peninsula REAA. Cultural Dynamics 1986

Teachers' salaries can vary widely depending on experience (0-13 years) and education (B.A. degree-Ed.D.). According to the FY85 salary schedule, a teacher with an M.A. degree and five years experience would earn $38,225. Custodians, secretaries, and cooks earn approximately $10-$12 per hour. If 75 percent of the REAA's revenues were distributed on a per capita basis, school expenditures in the five villages might total as much as $1.6 million for FY85. As noted above, expenditures by location are not available.

Cold Bay is in the Aleutian Region REAA. First quarter enrollment figures provided by the REAA show a decline in K-12 enrollment from 47 in December 1982 to 31 in December 1984. State revenues, based on Average Daily Membership (a measure of average attendance), were $16,674 per student in FY84 and $17,341 in FY85. As with the Lakes and Peninsula REAA, expenditures by location are not available from the Aleutian Region REAA. School employees at Cold Bay include four teachers (one of which is the head teacher); one half-time maintenance position; and one part-time special education aide. Payroll costs for FY 85 are $191.6 thousand. When 18 percent is added for benefits, personal services total $226.1 thousand. This is 30 percent higher than in FY82, when salaries were lower and there was no special education aide position. REAA personnel estimate an operating fund for the Cold Bay School as follows: FY85, $276.0 thousand; FY84, $277.0 thousand; FY83, $273.0 thousand; FY82, $225.0 thousand. School operations do not include food service or transportation, neither of which are provided at Cold Bay. A $1.8 million appropriation was made for a school addition in FY83 and is listed in Appendix A, with other Cold Bay capital projects.

Social Service and Other Grants. Social services encompass several purposes for which grants are provided to local entities. House Research estimates of the grant amounts for fiscal years 1981 and 1982 are in Tables 143A and 143B. These data are clearly partial. Less than 60 percent of the appropriations for the grant programs listed could be disaggregated by election districts. The data do, however, include programs amounting to over $60 million statewide in FY 1982, and give an indication of the range of social services participated in by the state through grant financing. For the social services grants included in Table 143A, the Kodiak election received 2.88 percent and 3.2 percent of the allocated portions of these grants, at a time when approximately 2.2 percent of the population resided in that district.

For fiscal years 1983 through 1985, data on grants and contracts were obtained from Department of Health and Social Services publications which list grants by service area, and the Department of Community and Regional Affairs and the Department of Administration. Many programs are excluded from the table, since they are statewide and so no breakout by area is available. See Table 144A and 144B. A large proportion of these grants and contracts are administered through the Kodiak Area Native Association (KANA). State and federal funds received by KANA are discussed in more detail later in this document.

Transfer Payments

The third major component of the operating budget examined here is transfer payments--cash payments made directly to individuals for which no production or services are made in return during the current period. This criterion of absence of current production is the essential difference between transfer payments and the wages and salaries component of spending presented earlier. Cash transfers are an important source of income to individual families and to the general economy of the state. Here we are interested in publicly funded transfers and do not deal with private transfers such as dividends paid by Native corporations. The transfer programs

TABLE 143A

Selected Social Service Grants/Claims ($000)
Kodiak Election District (14)

Purpose	FY 1981	FY 1982
Homemaker Services	89.1	--
Foster Care	16.2	29.6
Institutional Care	292.1	433.6
Domestic Violence	--	139.0
Aging Grants	157.7	197.6
Senior Citizen Homeowner Taxes	52.3	38.6
Day Care	132.8	149.9
CETA	38.3	--
Totals	778.5	988.3

NOTES: Other grants, such as Adult Supportive Services, Energy Assistance, CETA (in FY82), could not be allocated by place.

SOURCE: House Research Agency, State of Alaska, Report 81-188, Election District Breakdown of FY81 and FY82 Operating and Capital Budgets, February 5, 1982.

TABLE 143B

Social Service Grants/Claims ($000)
Aleutian Islands/Kodiak (Rural)
Election District 15

Purpose	FY 1981	FY 1982
Homemaker Services	1.0	--
Foster Care	15.4	21.4
Institutional Care	--	--
Domestic Violence	--	59.0
Aging Grants	--	7.0
Senior Citizen Homeowner Taxes	1.5	1.1
Day Care	--	--
CETA	45.8	--
Totals	63.7	88.5

NOTES: Election District 14 contains urban Kodiak and Ouzinkie; District 15 includes the remaining Kodiak villages, East Alaska Peninsula villages (the Chigniks, Perryville, Ivanof Bay) and the Aleutians (including Cold Bay). Election districts were reapportioned in 1983 (data for FY84). The new District 27, Kodiak/East Peninsula, contains all of Kodiak (urban and rural) plus the East Peninsula villages of interest in this study. Cold Bay is contained in new District 26, Bristol Bay Aleutian Islands.

SOURCE: House Research Agency, State of Alaska, Report 81-188, Election District Breakdown of FY81 and FY82 Operating and Capital Budgets, February 5, 1982.

TABLE 144

A. Grants and Contracts--Kodiak Service Area
Partial Listing ($000)

Purpose/Type	FY83	FY84	FY85
Public Health	23.2	160.6	205.6
Alcohol & Drug Abuse	285.0	265.0	265.0
Mental Health & Developmental Disabilities	305.2	730.6	898.2
Day Care Reimbursement	122.1	190.5	203.8
AK Public Broadcasting Comm.	N/A	279.7	279.7
Total	735.5	1,626.4	1,852.3

B. Grants and Contracts--Cold Bay Specific

Purpose/Type	FY83	FY84	FY85
Public Health	54.3	36.0	N/A

SOURCES: Department of Health and Social Services, Grants and Contracts, FY83, 84, 85, State of Alaska.
Department of Community and Regional Affairs.
Department of Administration.

TABLE 145

Longevity Bonus Payments
Kodiak/Shumagin Region

Fiscal Year	Average Monthly Number of Recipients	Approximate Payments Fiscal Year	Summation of Payments Since Inception
1980			
ED 14	124	$ 223,500	
ED 15	110	197,250	
1981			
ED 14	136	327,500	
ED 15	115	275,050	
1982			
ED 14	157	469,600	1,775,150
ED 15	121	361,600	1,256,600
1983			
ED 27[1]	225	674,250	
1984			
ED 27	286	761,750	
1985[2]			
ED 27	365	724,500	3,962,550

[1] See Figure 13 for a map with the Election District changes.

[2] As of December 15, 1984.

SOURCE: Alaska Longevity Bonus System Statistics (photocopies of microfiche films).

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The data available on these bonus payments is on the basis of election districts which were changed during the period under consideration. The numbers shown are approximations derived from Alaska Longevity Bonus System Statistics. Unfortunately, reports were available for only a few months, and some of the numbers were unreadable. Fiscal years 1980-1982 are reported for Election District 14--Kodiak-Urban--and Election District 15 --Western Gulf of Alaska (also known as Aleutians/Kodiak). Fiscal years 1983-1985 are for District 27--Kodiak-East Alaska Peninsula.

The increase in the number of program recipients between FY84 and FY85 reflects the expansions to all elderly Alaskans as opposed to just long-time residents. At the current rate, bonuses received in the area increase personal income by over $90,000 each month, over $1 million annually.

Permanent Fund Dividends. The Alaska Permanent Fund was established by constitutional amendment in 1976. The Fund is a trust or savings account to which a share of the state's petroleum royalty, bonus, and lease income is automatically deposited. Past legislatures have also appropriated funds to this account. While the Fund's principal is to be prudently invested and is not available for expenditure, the earnings can be appropriated for purposes chosen by the legislature. By statute half the Fund's earnings are currently used to make a direct cash payment to Alaska residents. The first year of the program, 1982, each qualified applicant received a payment of $1,000. Since 1982 the amount of the payment has been based upon the amount of earnings set aside for this purpose divided by the number of applicants. The 1983 payment was $386.15 per person, the 1984 payment was $331.29. The 1985 dividend was $440. Table 146 summarizes permanent fund dividend payments by community. The cash injection to the study region was nearly $11.6 million for 1982, falling to $4.3 million for 1983. If the number of recipients was stable between 1983 and 1984, the 1984 injection to the economy of the study region would be approximately $4.7 million.

TABLE 146

Permanent Fund Dividends
Kodiak/Shumagin Region

	1982[1]			1983[2]	
Community	No. of Recipients Children	No. of Recipients Adults	Total Amount ($000)	No. of Recipients	Total Amount ($000)
Kodiak	2,766	6,890	$9,656.0	9,205	$3,554.5
Akhiok	26	32	58.0	80	30.9
Karluk	44	49	93.0	94	36.3
Larsen Bay	70	80	150.0	154	59.5
Old Harbor	156	222	378.0	369	142.5
Ouzinkie	85	159	244.0	224	86.5
Port Lions	89	162	251.0	304	117.4
Chignik	61	95	156.0	352	135.9
Chignik Lagoon	31	52	83.0		
Chignik Lake	50	76	126.0		
Ivanof Bay	12	27	39.0	44	17.0
Perryville	52	70	122.0	126	48.7
Cold Bay	76	159	235.0	226	87.3

SOURCES: 1. Alaska Department of Revenue, 1982 Permanent Fund Dividend Applicant Profiles, State of Alaska, July 1984.
2. Alaska Department of Revenue, Research Division, April 1985.

Cultural Dynamics 1986

State Retirement Benefits. Retirement benefits comprise another category of transfer payments. Table 147 summarizes payments made by the Public Employees Retirement System (which includes former state and local employees of some municipalities) and the Teachers Retirement System. There are currently 64 individuals in the study region receiving a total of $69,480 per month, or $833 thousand per year. The mean income per recipient from this source is slightly over $13,000 annually.

TABLE 147

State Retirement Benefits by Location of Recipients

	1982		1983		1984		1985*	
Location	Recip-ients	Amount ($000)	Recip-ients	Amount ($000)	Recip-ients	Amount ($000)	Recip-ients	Amount ($000)
Kodiak	35	366.3	48	490.3	61	669.4	62	826.1
Chignik Lagoon			1	5.5	1	6.2	1	6.4
Ivanof Bay					1	2.0	1	1.0
Total	35	366.3	49	495.8	63	677.6	64	833.5

* 1985 is an estimate based on payments for the month of March 1985.

SOURCE: Computer run, Division of Retirement and Benefits, Department of Administration, April 1985.

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Public Assistance. The state and federal governments administer several transfer programs directed at low income individuals. These programs, which as a group are called public assistance, include Aid to Families with Dependent Children, Old Age Assistance, Aid to the Blind, and Aid to the Permanently Disabled. Two additional programs, General Relief-Medical and General Relief-Assistance which are state funded, are included in the caseload figures reported in Table 148. Although the bulk of the funds for these programs is federal, public assistance is administered by the Alaska Department of Health and Social Services.

More detailed information was available from the Alaska Department of Health and Social Services for the six-month period June through November of 1984. The state report MR013 of the Eligibility Information System provides number of recipients and amounts of payments for AFDC and food stamps. It also indicates the overlap between programs, i.e., how many recipients receive both AFDC and food stamps. See Table 149.

Not too much can be said given the limited time period covered by this data. However, the seasonal variation appears less pronounced than might be expected. Food stamps appear to be significant, with Kodiak receiving over $94,000 from this source over the six-month period. Substantial use of food stamps also occurs in the villages: Kodiak villages, nearly $82,000 (June-November); East Alaska Peninsula villages, nearly $23,000 (June-November).

Another source of data on transfer payments is the 1980 Alaska Census. Census data include Public Assistance and Social Security payments in the

TABLE 148

A. Kodiak Island

Public Assistance Payments by Community--Month of October

		1979	1980	1981	1982	1983	1984
Kodiak	-Caseload	(281)	(285)		(127)	(139)	(124)
	$ Amount	24,125	31,579	39,236	26,429	32,590	38,210
Akhiok	-Caseload	(5)	(8)		(3)		(4)
	$ Amount	828	1,175	1,538	1,163	N/A	1,613
Karluk	- Caseload	(11)	(11)		(7)	(4)	(8)
	$ Amount	2,035	1,850	2,599	2,219	1,070	2,778
Larsen Bay	-Caseload	(12)	(12)		(3)	(2)	(10)
	$ Amount	2,557	4,455	4,041	1,408	795	5,513
Old Harbor	-Caseload	(26)	(30)		(9)	(16)	(19)
	$ Amount	7,389	8,963	8,282	3,707	4,306	8,783
Ouzinkie	-Caseload	(19)	(17)		(11)	(9)	(10)
	$ Amoun	2,384	2,897	2,480	3,012	2,520	2,949
Port Lions	-Caseload	(16)	(14)		(9)	(6)	(10)
	$ Amount	1,562	2,259	2,886	2,189	1,819	3,148
Total-Kodiak Island		(370) 40,880	(377) 53,178	(N/A) 61,062	(169) 40,127	(176) 43,100	(185) 62,994

B. Alaska Peninsula

Public Assistance Payments by Community--Month of October

		1979	1980	1981	1982	1983*	1984
Chignik	-Caseload	(1)	(3)		(1)	(1)	(3)
	$ Amount	116	634	302	161	242	1,013
Chignik Lagoon	-Caseload	--	--	571	--	(1)	--
	$ Amount					597	
Chignik Lake	-Caseload	(12)	(8)		(7)	(7)	(7)
	$ Amount	2,135	1,351	1,545	2,327	1,766	1,774
Ivanof Bay	-Caseload	(1)			(1)	(1)	(2)
	$ Amount	116	--	250	250	241	355
Perryville	-Caseload	(5)	(6)		(6)	(7)	(4)
	$ Amount	1,235	1,473	1,433	1,473	1,693	1,062
Total East Alaska Peninsula Villages		(19) 3,602	(17) 3,458	(N/A) 4,101	(15) 4,211	(17) 4,539	(16) 4,204

N/A = Not Available; number of recipients in parentheses.

NOTE: Dollars Paid includes Old Age Assistance, Aid to the Blind, Aid to the Permanently Disabled, and Aid to Families with Dependent Children. Caseload figures include these programs plus General Relief Medical and General Relief Assistance. October is not necessarily representative of average activity level; however, this is the form published by the Department of Health and Social Services.

SOURCE: Public Assistance Recipient and Expenditure Study, Semi Annual Report, various years. Alaska Department of Health and Social Services. Also, House Research Agency, State of Alaska, Report 81-188, Election District Breakdown of FY81 and FY82 Operating and Capital Budgets, February 5, 1982.

TABLE 149

Food Stamps and AFDC Program

A. Payments 1984 ($)

		June	July	August	Sept	Oct	Nov
Kodiak	AFDC	34,321	32,227	29,453	29,336	24,032	27,319
	F.S.	21,143	19,669	15,286	14,808	16,529	21,899
Akhiok	AFDC	2,335	1,726	1,109	1,109	1,109	1,109
	F.S.	1,465	1,622	1,005	1,024	463	608
Karluk	AFDC	2,422	2,422	2,176	2,176	2,094	2,692
	F.S.	1,397	1,015	1,881	1,252	1,049	2,278
Larsen Bay	AFDC	7,229	8,203	7,220	4,863	4,981	7,521
	F.S.	3,963	2,883	1,742	1,376	755	1,973
Old Harbor	AFDC	9,278	10,788	7,866	7,413	7,576	9,427
	F.S.	8,064	9,766	6,157	5,783	4,100	5,337
Port Lions	AFDC	2,890	2,109	1,877	2,314	1,282	1,143
	F.S.	5,102	2,691	2,305	1,968	1,358	1,319
Total/ Kodiak Villages		44,145	43,225	33,338	29,278	24,767	33,407
Chignik	AFDC	0	0	0	0	683	683
	F.S.	856	119	693	1,917	155	441
Chignik Lake	AFDC	2,705	2,088	1,471	1,471	617	2,325
	F.S.	3,706	1,181	401	401	405	1,902
Ivanof Bay	AFDC	0	0	0	0	0	0
	F.S.	0	0	87	0	0	0
Perryville	AFDC	2,045	1,395	1,333	716	716	716
	F.S.	2,553	1,433	1,433	935	839	3,429
Total, East Alaska Peninsula Villages		11,865	6,216	5,418	5,440	3.415	9,496

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B. Recipients AFDC, Food Stamps (Both)--1984

	June	July	August	Sept	Oct	Nov
Kodiak	49,83(28)	41,70(33)	49,62(32)	47,74(30)	39,77(27)	43,84(33)
Akhiok	3, 3 (1)	3, 3 (1)	2, 3 (2)	2, 3 (1)	2, 2 (1)	2, 2 (1)
Karluk	5, 3 (2)	5, 2 (2)	4, 3 (2)	4, 3 (2)	4, 2 (2)	5, 3 (2)
Larsen Bay	9, 4 (6)	11, 2 (8)	11, 2 (7)	8, 3 (4)	8, 1 (3)	10, 1 (5)
Old Harbor	15,16(11)	17,19(12)	15,16 (7)	14,14 (6)	13,13 (5)	14, 9 (8)
Ouzinkie	5, 5 (4)	3, 7 (3)	6, 5 (5)	4, 4 (4)	3, 4 (3)	3, 5 (3)
Port Lions	3,15 (2)	3,10 (3)	3, 8 (3)	3, 8 (3)	2, 8 (2)	2, 5 (2)
Chignik	0, 4	0, 2	0, 2	0, 2	1, 1	1, 2
Chignik Lake	3, 3 (2)	3, 1 (2)	2, 1	2, 1	1, 1	2, 1 (1)
Ivanof Bay				0, 1		
Perryville	3, 6 (1)	3, 5 (1)	3, 3 (1)	2, 2 (1)	2, 2	2, 3 (1)

SOURCE: Department of Health & Social Services, State of Alaska, Report MR013, Eligibility Information System.

sources of income to households in 1979. As is shown in Table 150, the amounts reported for Public Assistance are significantly less than those shown in the expenditure reports by the Department of Health and Social Services for the Kodiak Island area. The largest discrepancy is for the City of Kodiak. This may result from the exclusion from the city totals of residents of Kodiak Island who reside in road-connected areas, but outside the boundaries of the city. These households were allocated to "undesignated" category in the place specific tables, since they did not reside in a community per se. This is approximately 2,000 people. The estimates of public assistance using state data for the East Alaska Peninsula villages are lower than the census numbers. One source of error may be reflected in movement among villages and the inclusion of Chignik Lake data in other villages.

TABLE 150

Public Assistance 1979 ($)
Comparison of Census and State Data

Community	Census 1979	No. of Households	H&SS[1] 1979	No. of Recipients of Various Programs Average March, October 1979
Kodiak	185,050	78	286,272	310
Akhiok	3,655	1	6,036	4
Karluk	5,410	1	27,390	11
Larsen Bay	19,315	11	32,544	13
Old Harbor	53,740	12	80,874	25
Ouzinkie	20,850	10	19,554	18
Port Lions	50,520	21	21,954	16
Kodiak Island Total	$338,540	134	$474,624	371
Chignik	14,415	3	1,392	1
Chignik Lagoon	1,310	2	1,080	1
Chignik Lake	--	--	24,786	12
Ivanof Bay	12,440	8	1,392	1
Perryville	24,995	3	13,296	5
Partial Total	$ 53,160	16	$ 41,946	20

[1] Annual amounts are March, October average times twelve.

SOURCE: U.S. Bureau of the Census. Public Assistance Recipient and Expenditure Study, Department of Health and Social Services, State of Alaska, March 1979 and October 1979.

A secondary source of discrepancy for all areas may result from using March and October as the base for calculating the annual amount from H & SS data. These months may be relatively high payment ones as compared to the higher income summer months. On the other hand, the Census data may understate public assistance income since the validity depends on estimates by the individuals surveyed as to their sources of income. This income data is obtained from self-declaration, and may include errors from several causes. For example, people may not know their income by source, or they may know but not wish to say. Further, there may be errors introduced through the methods and implementation of the survey technique, particularly in places with small populations.

Caseload data also show substantial discrepancies between Health and Social Services and Census reports. For example, Health and Social Services caseload data show that in Kodiak in October of 1979, 31 individuals were receiving Old Age Assistance, 2 were receiving Aid to the Blind, 25 Aid to the Permanently Disabled, and 59 Aid to Families with Dependent Children, for a total of 117. Another 164 were receiving either General Relief Medical or General Relief Assistance (which are strictly state programs). In contrast, according to the Census, only 78 households in the region had income from public assistance in 1979. State data is probably more inclusive, and there are undoubtedly overlaps among categories of recipients, that is, one household could be receiving Old Age Assistance as well as AFDC and GRA. It is likely that the actual amount received from public assistance lies somewhere between the Census numbers and the annualized state data.

Another source of information is a U.S. Department of Health and Human Services publication, Financial Assistance by Geographic Area. This document shows the amount which has been obligated (not expended) by HHS for specific recipients by location (state, county, and city). However, for many of the programs identified, a statistical proration technique is used to spread the fund geographically rather than an actual compilation of data by the specific location of recipients. For public assistance, the proration method used is to assume that funds are distributed to each area in the same proportion as are the number of beneficiaries in that area to the statewide total. The actual number of beneficiaries for the state as a whole and each sub-state district is provided to HHS through state reports to that federal agency.

In FY 83, using this method, $348,890 was allocated to Kodiak Island for public assistance payments. This includes AFDC, Aid to the Blind, Permanently and Totally Disabled, as well as the cost to administer and monitor performance of these programs. Since administration costs are included, this figure would tend to overstate the amount actually reaching recipients. Figures for previous years are not available from this source since the proration technique was not applied. Instead, the total amount for the state is shown as going to Juneau, where the headquarters of the administering state agency (Department of Health and Social Services) is located. Whatever the difficulties, this number appears closer to the amount indicated in Census data.

Energy Assistance Program. Another program which entails direct cash transfers to participants is the Energy Assistance Program. Although administered by the State Department of Health and Social Services, the program is federally funded. The program purpose is to aid low income households with their home heating expenses, and payment depends upon financial situation, home energy costs, and geographic location. Table 151 below summarizes payments which were made in FY 1983 and 1984 to residents of the study area. This program began in 1979 and has congressional authorization through FY86. The amount of funds received by each participating household depends on household size, income, and type of fuel used. For FY85, the maximum payment is $850, and the average is about $625 for the state as a whole.

TABLE 151

Energy Assistance Program
Participation and Expenditure FY83 and FY84

	Fiscal Year 1983		Fiscal Year 1984	
Community	Number of Participants	Amount of Payments	Number of Participants	Amount of Payments
Kodiak	275	$115,675	371*	$149,070
Kodiak Is. Villages:				
Karluk	21	13,225	22	15,025
Larsen Bay	24	15,056	31	16,110
Old Harbor	81	52,775	76	47,524
Ouzinkie	53	33,537	56	33,927
Port Lions	40	19,318	38	23,901
Total Kodiak Villages	219	$133,911	223	$136,487
Total Kodiak Island	494	249,586	594	285,557
East Alaska Peninsula**				
Chignik	N/A		15	10,500
Chignik Lagoon	N/A		2	1,400
Chignik Lake	N/A	(included w/Anchorage)	14	9,800
Ivanof Bay	N/A		6	4,200
Perryville	15	11,425	21	14,700
			58	$ 40,600
Cold Bay	N/A		5	3,950

* Akhiok is included in Kodiak figures.

** East Alaska Peninsula participants received their payments through the Bristol Bay Native Association which contracted directly with DH&SS in FY84. The number of recipients is actual; the amount is an estimate based on $700 per recipient.

SOURCE: Department of Health and Social Services, Division of Public Assistance, Energy Assistance Program, Participation and Expenditure by Community, FY 1984; file data, FY 1983.

Unemployment Compensation. Another transfer payment which flows into the Kodiak/Shumagin region is unemployment benefits. Alaska's unemployment insurance program is financed by state taxes on employees and state and federal taxes on employers. State taxes are deposited in a trust fund and regular benefits and 50 percent of extended benefits are paid from that fund. Federal taxes pay for program administration and for the remaining 50 percent of extended benefits. In calendar year 1982, $68.8 million intrastate claims were paid. Of those claims, $1,870,646 were paid in the Kodiak census division. Table 152 below gives more detail on payments totaling $1,503,661 made during calendar year 1983. The seasonal pattern of Kodiak's unemployment is obvious in the numbers. For 1983, the lowest monthly unemployment benefits ($40,744) occurred in July, followed by August ($43,263). The highest payments occurred in January ($181,099), followed closely by $180,740 paid out in April.

TABLE 152

Unemployment Compensation--Kodiak Census Division
Calendar Year 1983

	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr
Amount paid--all programs	$498,466	$473,486	$152,291	379,418
Number of weeks paid	4,432	4,678	1,428	3,478
Average weekly amt ($)	$ 112.47	$ 101.22	$ 106.65	109.09
Average duration (weeks)	11.0	13.7	14.0	13.8

Note: Average weekly payment = amount paid/number of weeks paid. Average duration = number of weeks paid/number of first payments

SOURCE: Department of Labor, Unemployment Payments by Month, by Census Division.

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The net impact of this program would need to consider the flow of tax collections out of the local economy into the trust fund from which benefits are paid. The data necessary to make such an adjustment for a substate region are not available. Whatever the net annual effect, it is expected that the monthly net would serve to have a stabilizing impact on the seasonal pattern of income fluctuations. That is, in the summer months of high employment income (and thus higher unemployment tax payments), inflow from unemployment benefit payment is low (a net outflow); while in the low employment months of winter, the program would result in a net inflow of funds to the area.

Although the amount of unemployment benefits is not available by community, the Department of Labor does publish some information distinguishing rural and urban payments by local offices. Although these local offices cover relatively large areas, some differences between rural and urban data can be distinguished. Table 153 shows that on average, payments to rural places were smaller and duration of payments (reflecting length of unemployment) was longer. Although these averages are derived from a region larger than that under consideration here, it seems likely that the differences reflected apply to rural and urban Kodiak as well. The lower average weekly payments in rural areas reflects lower wage earnings on which payments are based. The longer average duration is also consistent with the findings of higher long-term rates of unemployment in rural areas.

TABLE 153

Regular U.I. Benefit Payments
Kenai, Kodiak, Seward

	Amt of Payments ($000)		Average Weekly Payment		Average Duration	
Year	Urban	Rural	Urban	Rural	Urban	Rural
1977	$3,212.7	$1,605.0	$ 78.87	$ 75.43	15.6	21.1
1978	4,017.4	1,494.1	81.42	74.40	17.4	22.5
1979	3,563.6	1,359.3	79.59	73.99	16.2	20.1
1980	3,570.4	1,441.6	82.47	77.62	16.3	19.4
1981	5,203.7	1,672.5	118.33	104.29	14.4	17.7
1982	6,158.7	1,895.4	122.73	116.15	15.4	15.9

NOTE: Kenai/Kodiak/Seward Local Office Rural includes parts of the Aleutian Islands, Kenai/Cook Inlet, Kodiak and Seward Census Divisons. For the Kodiak segment, urban refers to Kodiak and areas connected by road; Kodiak rural refers to the non-road connected Kodiak Island villages.

SOURCE: Alaska Department of Labor, "Unemployment Insurance Actuarial Study and Financial Handbook," December 1983.

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Indirect Assistance

Most of the discussion thus far has dealt with direct expenditures by government in the Kodiak/Shumagin Region. The primary components of these expenditures are purchases of goods and services (which include payroll), grants to governments and non-profit organizations, and transfer payments to individuals. The State also has a variety of programs that indirectly benefit individuals. Most of the programs considered here are state loans that offer borrowers below market interest rates, and in some cases lower qualification requirements, and more lenient repayment schedules than would be found in traditional lending markets. In addition to loans, this section briefly covers the Power Cost Equalization Program which serves to reduce electric rates to customers of qualifying utilities.

TABLE 154

Alaska Housing Finance Corporation
Summary of Kodiak Loan Activity

FY	1981		1982		1983		1984	
	#	$000	#	$000	#	$000	#	$000
Single Family	92	9,449.7	83	7,443.6	67	5,618.7	85	6,794.9
Duplex	5	570.8	7	839.4	5	646.0	7	731.3
Planned Unit	5	398.9	12	963.7	0		9	581.5
Mobile Home	2	205.5						
Tri-Eight Plex	4	838.6	2	517.7	0		0	
Total	108	11,463.5	104	9,764.3	72	6,264.7	101	8,107.7
Weighted Av. Interest Rate		10.28%		9.92%		10.75%		9.72%
Mobile Home	16	726.1	13	455.3	15	555.7	12	402.1
Weighted Av. Interest Rate		10.8%		10.17%		12.09%		10.69%

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SOURCE: AHFC, Report Date, 1/28/85.

Housing Loans. The State of Alaska has several programs to assist residents in the purchase of and payment for housing. Attention here is focused on the State-Assisted Mortgage Program and Mobile Home Loan Purchase Program of the Alaska Housing Finance Corporation (AHFC). Through these programs, AHFC purchases residential mortgages with below market interest rates. The amount of the interest subsidy varies with changes in market interest rates. Table 154 summarizes AHFC loan activity in Kodiak. Over the last four years AHFC has made 441 loans totalling $37.8 million in Kodiak at weighted rates of interest ranging from 9.72 percent to 12.09 percent.

The Housing Assistance Division of the Department of Community and Regional Affairs is also involved in subsidized loans for housing. Their activity is summarized in Table 155. Over the period a total of 142 loans have been

TABLE 155

Housing Assistance Division
Loan Activity Kodiak Area

FY	1981		1982		1983		1984		1985	
	#	$000	#	$000	#	$000	#	$000	#	$000
Kodiak	3	169.3	11	1,110.8	43	4,512.0	32	3,277.9	47	4,740.4
Chiniak					1	56.4	2	160.2	1	81.0
Port Lions							2	103.5		

SOURCE: Housing Assistance Division, Report Date, Feb. 5, 1985.

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made with a principal value of $14.2 million. Interest rates for Housing Assistance Loan Programs are set by statute and are currently 10.5 percent.

General Loan Programs (Dept. of Commerce and Economic Development). Alaska has several loan programs designed, through interest subsidies, to encourage various types of activities. Tables 156 through 159 summarize loan activity in the study area over the past several years. Table 156 includes programs financing commercial fishing activities. Until FY82, the Division of Business Loans of the Department of Commerce administered many of the fishing loan programs. Since that time, most of these loan activities have been assumed by CFAB (the Commercial Fishing and Agriculture Bank) and AIDA (the Alaska Industrial Development Authority). The Division of Business Loans no longer exists, but the Division of Investments in the Department of Commerce administers programs providing permit loans to individuals (known as Section A loans); permit, vessel and gear loans to individuals (Section B); and vessel and gear loans to corporations, partnerships or joint ventures (Section C). No Section C loans had been made in the study area as of the end of January 1985. In the years FY83 through the first half of FY85, $4.1 million commercial fishing loans to 51 individuals had been made under these programs.

The Fisheries Enhancement Loan Program makes loans to qualified regional associations or private non-profit corporations for planning, construction, and operation of hatchery facilities. One loan of this type was made in Election District 27, in July 1984.

The Alaska Industrial Development Authority assists local businesses in obtaining long-term financing for establishing and expanding facilities in the state. AIDA arranges for tax-exempt debt financing under federal regulations. There is no state subsidy involved since borrowers pay the cost of funds plus administrative costs. The federal government bears the cost through lower tax revenues. The AIDA loan amounts shown in Table 156 were for the purchase of an existing processing plant and for fishing vessels.

The Alaska Commercial Fishing and Agriculture Bank, which began operating in 1980, is a private lending cooperative which also serves the public purpose of encouraging the fishing and agriculture industries. CFAB's creation involved a loan of $32 million from the State of Alaska. Table 157 shows the amount of CFAB loans outstanding in the study region as of the end of FY84.

Business loans are shown on Table 158. Before FY 1982, the Department of Commerce (Division of Business Loans) made loans for the acquisition, financing, refinancing, and equipping of Alaska businesses under the Small Business Loan Program. These loans were made to a variety of businesses including farming, mining, and fishing. Loans were also made under a program specifically designed for businesses directly involved in the tourist industry. These programs were terminated as of July 1, 1981, after which these types of loans were available through AIDA. AIDA activity shown on Table 158 includes financing of office building construction, construction and additions to hotels and motels, purchase of equipment (e.g., barge crane), and construction of commercial buildings. As the result of the

TABLE 156

Fisheries Related Loans
Election District 14 - Kodiak/Urban

	Commercial Fishing[1]		Fisheries Enhancement		AIDA	
FY	($000)	#	($000)	#	($000)	#
1979	6,197.6	48				
1980	2,198.7	30				
1981	1,789.6	31			90.0	1
1982	1,345.1	25			215.0	1
Fisheries Related Loans Election District 15 - Aleutians/Kodiak Rural						
1979	1,772.8	23				
1980	3,612.0	35				
1981	1,932.6	11				
1982	189.0	2				
Fisheries Related Loans Election District 27						
1983	1,497.9	22			850.0[2]	1
1984	1,898.3	18				
1985[3]	722.8	11	100.0	1		

[1] Commercial Fishing includes commercial fishing (1979-83), Fishermans Mortgage and Note (1982), Permit Loans to Individuals (1983-85), Permit, Vessel and Gear Loans to Individuals (1983-85).

[2] Purchase of existing processing plant.

[3] July 1984 through January 1985.

SOURCE: Division of Accounting and Collections, Department of Commerce and Economic Development. Alaska Industrial Development Authority.

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transfer of a portion of Division of Business Loans' portfolio to AIDA, the authority holds in this region loans with an original value of over $6 million and a current balance outstanding of $3.7 million. Approximately 80 percent of the loans are for fishing vessels.

Table 159 shows energy loan activity in the Kodiak/Shumagin Region. These loan funds are of recent origin, beginning operations in FY'81. The Residential Energy Conservation Loan Program was designed to finance residential energy audits and conservation improvements resulting from those audits. Bulk Fuel Loans were designed to assist small municipalities or unincorporated villages overcome the cash flow problem associated with

TABLE 157

Alaska Commercial Fishing and Agriculture Bank
Loans Outstanding ($000)

	July 1984
Kodiak	$ 16,437.8*
Old Harbor	239.1
Port Lions	77.0
Subtotal	$ 16,753.9
Chignik	204.6
Chignik Lake	190.4
Subtotal	$ 395.0
Total-Study Region	$ 17,148.9

*By November 1984 the amount outstanding in Kodiak had declined from $16.4 million to $13.9 million, reflecting five foreclosures and payments reducing principal.

SOURCE: Alaska Commercial Fishing and Agriculture Bank

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TABLE 158

Business Loans
Election District 14 - Kodiak (Urban)[1]

	Small Business		Tourism		AIDA (Bond Sales)[2]	
FY	($000)	#	($000)	#	($000)	#
1979	635.0	3				
1980	2,297.9	11				
1981	464.2	4	75.8	1		
1982					300.0	1
1983					875.0	2
1984					4,450.0	3
1985					345.0	1

[1] Two small business loans were made in Election District 15 (Aleutians/Kodiak Rural), totaling $421.5 thousand.

[2] Figures include financing of fishing related businesses.

SOURCE: Division of Accounting and Collections, Department of Commerce and Economic Development. Alaska Industrial Development Authority.

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annual purcahses of fuel in bulk. They are short term loans which must be repaid within one year. Eight of these loans have been made to villages in the study area over the last two and a half fiscal years. Alternative Technology and Power Resource Loans are designed to encourage projects that will serve to reduce fossil fuel usage for energy generation. The funds are intended for alternative energy systems, or the use of such systems in such activities as waste disposal, food production, transportation, building design, or industrial enterprise. Only 5 such loans have been made in the Kodiak region since the inception of this program.

TABLE 159

Energy Loans
Election District 14--Kodiak Urban

FY		Alternative Energy ($000)	Alternative Energy #	Residential Energy Conservation ($000)	Residential Energy Conservation #	Bulk Fuel ($000)	Bulk Fuel #
1981		31.5	4	5.0	1	--	--
1982		13.8	4	50.4	15	--	--
	Total	45.3	8	55.4	16		
Energy Loans Election District 15--Aleutians/Kodiak Rural							
1981		9.0	1	--	--	---	--
1982		10.0	1	--	--	40.1	2
	Total	19.0	2			40.1	2
Energy Loans Election District 27--Kodiak/East Alaska Peninsula							
1983		5.3	3	23.1	6	10.0	1
1984		2.7	1	5.0	1	82.7	3
1985*		1.5	1	--		145.5	4
	Total	9.5	5	28.1	7	238.2	8

*July 1984-January 1985.

SOURCE: Division of Accounting and Collections, Department of Commerce and Economic Development.

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Power Cost Assistance. The Power Cost Equalization Program (formerly called the Power Production Cost Assistance Program) was designed to lower electricity rates to consumers in high cost areas. This subsidy is paid directly to utilities, who pass the benefit through to consumers in the form of lower rates. Subsidy rates depend on the level of eligible costs, and currently apply to the first 750 kilowatt hours used per residential customer per month, as well as 70 kilowatt hours per resident per month for community facilities. Communities benefiting from this program include Kodiak, Port Lions, Ouzinkie, Larsen Bay, and Chignik. Tables 160 through 161 summarize the program's effect on these communities.

The electric rate subsidy program has gone through several revisions (and renamings) complicating analysis. The summary tables presented here identify payments by program over time. Average residential rates shown are the weighted average rates charged residential customers for the first 600 kilowatt hours used each month. These rates include fuel surcharges, and were calculated from data reported by utilities to the Alaska Public Utilities Commission. Average program subsidy in cents per kilowatt hour indicates how much higher rates would have been without the power cost assistance program. Monthly average and annual payments show dollar amounts received by the utilities from the state to offset the lower rates offered to electricity consumers.

TABLE 160

Kodiak--Power Cost Program
1980-1984

	PPCA[1] 1980	PPCA[2] 1981	PCA[3] 1982	PCA 1983	PCA[4] 1984
Average Residential Rate, 1st 600 kwh, Inc. surcharge (¢/kilowatt hr)	15.35	16.12	16.75	16.68	17.00
Average Program Subsidy (¢/kwh)	1.19	1.90	1.93	1.133	.342
Monthly Average Program Payment ($000)	21.0	29.6	28.1	18.9	6.1
Total Annual Program Payment ($000)	63.0	355.5	365.4	226.5	36.4

PPCA = Power Production Cost Assistance; PCA = Power Cost Assistance.

[1] October-December 1980 only

[2] January-November 1981 only

[3] December 1981 included under this program

[4] January-June 1984 only--Kodiak not eligible for Power Cost Equalization program after June 1984

SOURCE: Calculated from data supplied by the Alaska Power Authority and Alaska Public Utilities Commission.

Kodiak area residents received a total of over $1 million of state funds in the form of lower electric rates between October 1980 and June 1984. Although Kodiak and Port Lions are no longer eligible for this program, electric rates will continue to be subsidized as the result of state investment in the recently completed Terror Lake Hydroelectric Project (which is discussed elsewhere in this report). The reduction in Kodiak electric rates, which averaged between 1.1¢ and 2.8¢ per kilowatt hour, is quite small relative to those provided by the program to eligible villages. For example, Port Lions' rates were subsidized by averages ranging from approximately 16¢ to nearly 31¢ per kilowatt hour. The total dollar amount of subsidy is much less ($434,100) for Port Lions, given the much smaller population and lower average usage of electricity.

TABLE 161

Port Lions--Power Cost Program
1980-1984

	PPCA[1] 1980	PPCA[2] 1981	PCA[3] 1982	PCA 1983	PCA[4] 1984
Average Residential Rate Exclusive of surcharge, 1st 600 kwh (¢/kilowatt hr)	21.33	21.93	40.75	48.91	48.91
Average Program Subsidy (¢/kwh)	16.99	16.14	30.84	29.93	29.13
Monthly Average Program Payment ($000)	3.4	4.1	11.0	11.4	11.2
Total Annual Program Payment ($000)	10.2	45.3	143.5	137.2	100.8

PPCA = Power Production Cost Assistance; PCA = Power Cost Assistance.

[1] October-December 1980 only

[2] January-November 1981 only

[3] Includes December 1981

[4] January-September only. Port Lions is no longer eligible for Power Cost Equalization Program. As of 11/84 rates are consolidated with Kodiak.

SOURCE: Calculated from data supplied by the Alaska Power Authority and Alaska Public Utilities Commission.

TABLE 162

Ouzinkie--Power Cost Program
1982-1984

	PCA[1] 1982	PCA 1983	PCA[2] 1984	PCE[2] 1984
Average Residential Rate for first 600 kwh (¢/kwh)	29.0	29.0	21.1	21.32
Average Program Subsidy (¢/kwh)	15.23	14.88	14.644	15.942
Monthly Average Program Payment ($000)	3.0	3.6	4.5	3.0
Total Program Payment ($000)	17.8	42.8	31.3	15.1

[1] PCA = Power Cost Assistance, July through December 1982.

[2] PCA = Power Cost Assistance, January through July 1984.
PCE = Power Cost Equalization, August-December 1984

SOURCE: Calculated from data supplied by the Alaska Power Authority and Alaska Public Utilities Commission.

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TABLE 163

Chignik and Larsen Bay--Power Cost Equalization
(1984, October-December)

	Chignik	Larsen Bay
Average Residential Rate (¢/kwh)	30.00	40.00
Average Program Subsidy (¢/kwh)	17.47	24.21
Monthly Average Program Payment ($000)	2.6	4.42
Total Program Payment ($000)	7.8	12.7

SOURCE: Calculated from data supplied by the Alaska Power Authority and Alaska Public Utilities Commission.

Ouzinkie residents had received approximately $107,000 from power cost programs through the end of 1984. Larsen Bay and Chignik became eligible in October 1984 under the Power Cost Equalization Program, and had received approximately $12.7 thousand and $7.8 thousand respectively by the end of 1984. In Larsen Bay, rates are about 24¢ per kilowatt hour less than they would be without the subsidy, and in Chignik they are reduced by approximately 17.5¢ per kilowatt hour.

Student Loans. The Alaska Commission on Postsecondary Education, Division of Student Financial Aid, administers a popular student loan program for Alaska residents. A qualified applicant may borrow $6,000 per year ($7,000 for graduate students), for a maximum of eight years. The repayment period is ten years, beginning a year after the end of study, at an interest rate of 5 percent. Up to one-half of the loan may be forgiven (cancelled) if the borrower works for more than six years in Alaska after completing his/her studies. It has been estimated that from the state's point of view there is a subsidy of $659 for each $1000 loan for which payment is deferred for five years.[2] Table 164 summarizes the current amount of student loans outstanding to students with permanent addresses in the study region.

TABLE 164

Student Financial Aid
Kodiak/Shumagin Region

Community	Current Balance	Number of Loans Undergraduate	Graduate
Kodiak	$ 1,385,652	287	21
Kodiak Station	71,150	14	3
Larsen Bay	8,000	2	0
Old Harbor	15,050	2	1
Ouzinkie	25,933	6	0
Port Lions	16,350	3	0
Total Kodiak Island	$ 1,522,135	314	25
Chignik	10,450	3	0
Chignik Lagoon	9,400	2	0
	$ 19,850	5	0

SOURCE: Student Financial Aid System, Commission on Postsecondary Education, February 1985

Cultural Dynamics 1986

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[2] This calculation assumes an opportunity cost of 14 percent for the funds used. This does not include the subsidy value of forgiveness. Division of Budget and Management, State of Alaska, "Overview of State Loan Programs and Investment Funds," 1982. Although the opportunity cost figure is arguably high given current interest rates, this is more than offset by the forgiveness provision.

Using the subsidy estimate given above, if payment on these loans is deferred an average of five years, these loans contribute a subsidy of over $1 million to the study region. The actual contribution to the local economy, however, is not clear from these figures. The majority of these students attend school outside of the region. Loans to students attending the University of Alaska, Kodiak during the 1984-85 school year totaled less than $150,000 for 33 students. It can be assumed, however, that some of the 344 students who have permanent addresses in the region, and who attend school elsewhere, would have gone to school without state loans. To the extent that these students would have been financed by families in the study region, student loans reduce the outflow of funds from the region.

STATE CAPITAL EXPENDITURES

A major element of state spending during the last several years has been expenditures for construction projects, major repair or renovation of existing facilities, and other items classified as capital because of their long-lived nature (e.g., computer systems, resource inventories). Capital spending is of critical importance to the local economy in several ways. The construction projects impact the local economy through expenditures on supplies and creation of jobs. The facilities, once in place, afford services to the local populous, and may improve the business environment (for example, through improvement of the local transportation system or lower costs for utilities). Capital projects also have important fiscal implications for the localities in which they occur. The effects do not end with the completion of a project. Once the infrastructure is in place, in most cases there will be an implicit or explicit commitment of future revenues necessary to support that infrastructure. These commitments may include maintenance and replacement investment, debt service, and funds to operate programs associated with the facility. In the case of most state construction grants to municipalities, the locality must agree to assume the responsibility for facility operation and maintenance costs.[3]

Data concerning the actual timing and expenditure of funds for capital purposes by place would have to be developed on a project by project basis. Such an approach was not feasible given the scope of this study. Instead, the tables and discussion which follow contain information on state appropriations for capital purposes rather than expenditures per se.

Appropriations may differ from expenditures in timing. For example, an FY82 appropriation may not be expended until FY83; or an appropriation may be for a multi-year project which is spent gradually, and not necessarily evenly, over several years. Expenditures and appropriations may differ in amount if the cost of the project is less than expected, or if project design is changed, bonding is not approved, or if the project is cancelled. There may even be differences in program purpose, as reappropriations are made and projects altered. As a result care should be taken in interpreting the appropriations data given here.

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[3] This subject is dealt with at length in Public Capital Formation in Alaska: Current Levels, Fiscal Effects and Future Prospects, Goldsmith, Lehr, and Rowe, ISER 1984.

Appendix A lists individual project appropriations by place, title, time and, for Kodiak and the Kodiak Island Borough, by project type. Local officials and construction experts will be able to adjust totals based on their knowledge of actual local activities. Appropriations data were derived from Election District Reports of the Legislative Affairs Agency, departmental records of the Alaska Department of Community and Regional Affairs and the Department of Transportation and Public Facilities, and listings by the Bristol Bay Native Corporations. Tables 165 and 166 show appropriations to the town of Kodiak. Appropriations made specifically to Kodiak villages are summarized in Table 167.

It was necessary to make some arbitrary decisions when classifying projects by type. In some cases the exact nature of the project was not clear. However, projects by title are listed in Appendix A, for the interested reader. It is also common for a variety of projects to be grouped under a short title which does not reference the total project content. Appropriations made specifically to the Kodiak Island Borough, areawide projects, and large projects outside of the municipality such as the Terror Lake Hydroelectric Project are included in the Borough totals. Decisions as to inclusion in Table 165 versus Table 166 were essentially arbitrary.

Summary Table 167 shows total appropriations for the study area. Between FY78 and FY85 a total in excess of $217 million was appropriated to the Kodiak Island area. Of this, approximately 38 percent was for the Terror Lake Hydroelectric Project (appropriations occurred during FY81 and FY82). For the years FY81-FY85, appropriations ranged from $16.8 million to $102.5 million for an average annual amount of almost $40 million. Other important categories of capital appropriations for Kodiak city and Kodiak Island Borough (exclusive of specific village appropriations) include highways (22.7%), ports and harbors (7.5%), water, sewer, and solid waste (6.7%).

Local capital construction projects have centered on elementary and secondary schools. Much of school construction was funded through direct state appropriations, as shown on Table 166, Kodiak Island Borough, under the category Schools K-12. Additional school construction has been financed by locally issued general obligation bonds. Since the state pays up to 90 percent of debt service on these school bonds, this represents another major form of state spending for capital facilities in the local area. Table 168 lists school construction projects as described in borough publications, and Table 169 shows state debt reimbursements to the Kodiak Island Borough School District.

Reimbursement shown in Table 169 includes cigarette tax proceeds and entitlement grants under the state aid for retirement of school construction debt program.

Table 170 shows annual appropriations to each of the villages in the Kodiak/Shumagin study region and to Cold Bay. Over the period FY78-FY85, the Kodiak villages received about $26 million in state appropriations, $25.4 million of which we have allocated to specific places. Of this $25.4 million, Port Lions received 32.9 percent; Ouzinkie, 20.6 percent; Old Harbor, 16.2 percent; Larsen Bay, 14.1 percent; Ahkiok, 9.5 percent; and Karluk, 6.6 percent.

TABLE 165

State Capital Appropriations--Kodiak ($000)

Type of Project	1985	1984	1983	1982	1981	1980	1979	1978	Total FY 78-85	
Highways	17,739.0	6,051.0	3,200.0	3,514.5	6,730.0*	3,800.0	--	--	41,034.5	incl. 5,000.0 G.O. Bonds
Aviation			430.0		2,160.0				2,590.0	
Ports & Harbors	1,000.0	750.0	500.0	940.0	4,790.0*	900.0	2,500.0		11,380.0	incl. 4,500.0 G.O. Bonds
Water/Sewer/Solid Waste	2,600.0	3,109.8	1,428.0	140.0	--	200.0	--	--	7,477.8	
Community Facilities	1,700.0	83.0	275.0	3,809.1**	--	700.0	258.5	20.0	6,845.6	
Public Safety/Justice	525.3	425.0	--	1,168.6	--	35.0	--	--	2,153.9	
Fish & Wildlife	--	99.9	--	100.0	4,218.8*	--	36.0	300.0	4,754.7	incl. 4,218.0 G.O. Bonds
Parks & Recreation	--	400.0	--	242.5	--	--	--	--	642.5	
Education	500.0	16.0	50.0	--	2,000.0*	64.0	1,275.0*	--	3,905.0	incl. 3,275.0 G.O. Bonds
Health/Social Services	--	94.9***	250.0	387.0	--	--	39.0	--	770.9	
TOTAL	24,064.3	11,029.6	6,133.0	10,301.7	19,898.8	5,699.0	4,108.5	320.0	81,554.9	16,993.0 G.O. Bonds

* Includes General Obligation Bonds.
** Includes Per Capita Aid Entitlement which could be used for a variety of projects.
*** Includes grant for energy conservation audits and grants.

Election District Reports, Free Conference Committee FY 1978-1985.
Appropriations by project title are listed in Appendix A.

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TABLE 166

State Capital Appropriations--Kodiak Island Borough ($000)

Type of Project	1985	1984	1983	1982	1981	1980	1979	1978	Total FY 78-85	
Highways	441.0	420.0	1,090.0	581.0					2,532.0	
Ports & Harbors	3,000.0	--	--	--					3,000.0	
Water/Sewer/Solid Waste	1,810.0	--	--	3,518.8	25.0				5,353.8	
Community Facilities	100.0	295.5	350.0	2,608.5**		43.0	--	35.0	3,432.0	
Fish & Wildlife	--	--	--	--	197.0	--	--	--	197.0	
Power/Energy	--	--	10,840.0	74,100.0	200.0	3,720.0			88,860.0	
Parks & Recreation	107.0	35.0	65.0	1,519.5	--	--	97.0*		1,823.5	includes 85.0 G.O. Bonds
Schools K-12	900.0	463.0	400.0	2,000.0	--	18.6	--	--	3,781.6	
Misc. Village Projects	344.9	--	185.0	--	145.0	--	--	--	674.9	
Planning	40.0	--	175.0	37.0	--	479.0	--	--	731.0	
TOTAL	6,742.9	1,213.5	13,105.0	84,364.8	567.0	4,260.6	97.0	35.0	110,385.8	

* Includes General Obligation Bonds

** Includes Per Capita Aid Entitlement which could be used for a variety of projects.

TABLE 167

Summary of State Capital Appropriations
Kodiak/Shumagin Region ($000)

Location	Fiscal Years 1985	1984	1983	1982	1981	1980	1979	1978	Total FY 78-85
Kodiak	24,064.3	11,029.6	6,133.0	10,301.7	19,898.8	5,699.0	4,108.5	320.0	81,554.9
Kodiak Is. Borough	6,742.9	1,213.5	13,105.0	84,364.8	567.0	4,260.6	97.0	35.0	110,385.8
Kodiak Villages	3.510.8	4,525.0	490.0	7,862.4	5,690.7	623.1	2,638.1	80.0	25,420.1
Sub-Total, Kodiak	34,318.0	16,768.1	19,728.0	102,528.9	26,156.5	10,582.7	6,843.6	435.0	217,360.8
East Pen. Villages	2,045.8	1,710.0	254.7	3,354.6	727.0	364.9	529.0	13.5	8,999.5
Cold Bay	--	50.0	1,800.0	520.0	--	4,950.0	--	15.0	7,335.0
TOTAL, Study Region	36,363.8	18,528.1	21,782.7	106,403.5	26,883.5	15,897.6	7,372.6	463.5	233,695.3

Cultural Dynamics

TABLE 168

Kodiak School District
Construction Activity

		Source			
		KIB		EDR	Notes
Kodiak					
in progress	HS Auditorium Construction	1,217.13	grant	900.0*	*Includes Main Elementary
1984	HS Auditorium Design			294.0	
1984	Junior High School Renovation	8,200.0	bonds		
1984	East Ball Diamond & Parking Const.	50.0	bonds		
1983	HS Lockerroom/Boiler Replacement	324.0	grant		
1983	New Main Elementary Construction	6,882.0	bonds		*
1982	East Elementary Gym	1,437.0	bonds		
1982	Swimming Pool Replacement	885.47	bonds		
1982	HS Roof	484.77	bonds		
Borough-wide					
in progress	Kodiak Is. Schools Upgrade	169.0	grant	169.0	Anticipated
	Peterson Elementary School Design Corrections				Fed. 970.0
1983	Playgrounds (7) Replacement	789.23	bonds		
1983	Kodiak Schools Improvement			400.0	
Villages					
1984	Larsen Bay Fuel Tanks Corrections				Boro. 11.05
1984	Chiniak School Construction	1,991.0	grant	2,000.0	
1982	Old Harbor School Residing	100.0	grant	50.0	
1982	Akhiok School Construction	2,160.0	bonds		
1981	Karluk School Construction	1,654.38	grant	960.0	GO Bonds
1980	Chiniak School Repairs			18.6	
1980	Ouzinkie School Construction			100.0	
1979	Ouzinkie School Construction			1,001.0	
1979	Larsen Bay School Construction			1,637.1	

SOURCE: Kodiak Island Borough, Annual Report, Fiscal Years 1983 and 1984 (newspaper tabloid). Election District Reports of the Free Conference Committee, Legislative Affairs Agency, FY 79-FY 85.

Cultural Dynamics

TABLE 169

State Reimbursement of School Construction Costs
Kodiak Island Borough School District

Fiscal Year	Reimbursement ($000)	Fiscal Year	Reimbursement ($000)
1979	428.8	1983	444.2
1980	468.5	1984	1,683.3
1981	675.2	1985	1,539.3
1982	696.6		

SOURCE: Alaska Department of Education, Division of Management Law and Finance, April 1985.

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Approximately 70 percent of the appropriation to the Kodiak villages over this period were for the following types of projects: harbors and breakwaters (20.6 percent); airports (20 percent); schools (14.8 percent); water, sewer, solid waste facilities (7.5 percent); and roads (7 percent).

Until 1981, capital appropriations to the East Alaska Peninsula villages were relatively small. However, for the period FY81-FY85, over $8 million was appropriated for various capital projects such as schools, water and sewer, airports, generators, health clinics, bulk fuel storage, and equipment. Appropriations were distributed among the five communities as follows: Chignik Bay, 39.7 percent; Chignik Lagoon, 13.5 percent; Chignik Lake, 24.4 percent; Ivanof Bay, 3.8 percent; Perryville, 18.6 percent. Separate estimates of actual expenditures on schools exceed appropriated amounts reported in the Election District Reports. These discrepancies are noted in Appendix A where project listings for both Kodiak and Peninsula villages are provided.

Cold Bay has received $7.3 million in capital appropriations since FY80. Three major projects--a school addition, mooring facilities, and runway resurfacing--comprise 92 percent of this total. According to the Election District Reports for FY85 and FY84, Cold Bay received no appropriations for FY85 and only $50,000 in FY84.

Local Government

OPERATING EXPENDITURES AND REVENUES

Kodiak Island Borough

Kodiak local government includes the Kodiak Island Borough (KIB) and the City of Kodiak plus the second class cities within the borough. The KIB is responsible for areawide functions which include planning and zoning, health (including the Kodiak Island Hospital and Mental Health Center), and education. The education function is carried out through the KIB School District discussed earlier in this report. The Borough also supports local

TABLE 170

State Capital Appropriations--Kodiak/Shumagin Villages

	1985	1984	1983	1982	1981	1980	1979	1978		
Akhiok	660	1,635	15	83.3	321	--	--	--	2,425.4	
Karluk	360	50	60	200	1,020*	--	--	--	1,690.0	Includes $960. GO Bonds
Larsen Bay	890	198	165	288.1	400	--	1,637.1	--	3,578.2	
Old Harbor	953.7	800	50	874.5	990	450	--	--	4,118.2	
Ouzinkie	279.1	60	200	3,527.1	--	173.1	1,001	--	5,240.3	
Port Lions	368	1,782	--	2,889.2	3,248.6*	--	--	80	8,368.0	Includes $1,100. GO Bonds
Total	3,510.8	4,525	490	7,862.4	5,690.7	623.1	2,638.1	80	25,420.1	
Chignik Bay	768	882.0	100	569	700				3,569.0	
Chignik Lagoon	873	15	--		316	--	13.0	--	1,217.0	
Chignik Lake	230	750	--	1,119.6	--	100			2,199.6	
Ivanof Bay	100	--	50	100	27	65	--	--	342.0	
Perryville	74.8	63	104.7	1,250.0	--	149.9	16	13.5	1,671.9	
Total	2,045.8	1,710.0	254.7	3,038.6	1,043.0	364.9	529.0	13.5	8,999.5	
Cold Bay	--	50	1,800	520	--	4,950	--	15	7,335.0	

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service districts (at the request of residents) in the provision of road maintenance, water and sewer, and fire protection. Additionally, the Borough is involved in developing parks and recreation facilities, coastal management, design and construction of water and sewer systems, and provision of planning assistance and capital project assistance to villages within the borough. Table 171 shows the number of full-time employees and total salaries since FY 1980.

TABLE 171

Kodiak Island Borough
Direct Employment

Fiscal Year	Number of Employees[1]	Payroll ($000)
1980	32	407.2
1981	37	743.2
1982	39	793.6
1983	46	1,342.0
1984	49	1,491.9
1985	42	1,401.7

[1] Employees include Mental Health Center employees--16 in 1985, 19 in 1984. Hospital and School district employees are not included.

SOURCE: Kodiak Island Borough, Annual Report, Fiscal Year 1983 and 1984. (newspaper tabloid).

Cultural Dynamics 1986

Table 172 shows the distribution of expenditures by the Borough for the last seven years. The table is divided into two segments since the expenditure categories were slightly different between the data sources used. Borough expenditures, exclusive of the Mental Health Center, have increased at an average annual rate of 18.9 percent between FY79 and FY84, or a rate of 12.6 when the figures are adjusted for inflation. Although the Mental Health Center is currently an agency of the borough and is provided with administrative and financial support, Mental Health Center operations were not included in the Borough expenditures in Table 172 until FY84. The Center, which provides outpatient counseling, therapy, education, and crisis intervention, as well as a residential and vocational training program, is primarily state funded in the form of direct grants and third party payments for services. The Mental Health Center budget history since FY 1979 is presented in Table 173.

The budget for FY86 for the Mental Health Center is $911.3 thousand. Approximately 70 percent of the budget is devoted to personal services. In FY85 the staff numbered 16.

TABLE 172

(A) Kodiak Island Borough Expenditures (FY83-85)

	FY'85	FY'84	FY'83
General Government	$2,055.8	$1,953.9	$1,801.7
Educational Support[1]	2,244.0	1,600.7	1,924.4
Hospital Support	461.0	396.7	263.0
Health & Sanitation	1,414.3	1,106.7	519.3
Transfers to Other Funds	1,235.6	620.4	557.1
Total	$7,410.7	$5,678.3	$5,065.5

[1] Includes Community College, Village & City libraries, public radio and school district appropriations.

SOURCE: Kodiak Island Borough, Annual Report, Fiscal Year 1983 and 1984. (newspaper tabloid).

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(B) Kodiak Island Borough Expenditures (FY'79-82)

	FY'82	FY'81	FY'80	FY'79
General Government	$1,649.3	$1,287.0	$ 977.5	$ 829.7
Educational Support [1]	676.9	1,066.9	1,023.4	824.2
Health (includes hospital support)	710.8	342.7	189.3	163.5
Transfers and Contributions	856.3	1,091.8	718.8	327.4
Total	$3,893.3	$3,788.5	$2,909.0	$2,144.6

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[1] Includes school district appropriation only.

SOURCES: Kodiak Island Borough, (descriptive brochure) May 1983, 21 pages plus appendices.

Kodiak Island Borough, Financial Statements, Fiscal Year 1975, 1981, 1982.

Cultural Dynamics

TABLE 173

Kodiak Mental Health Center Expenditures
FY1975 - FY 1985 ($000)

Fiscal Year	Mental Health Personnel	Mental Health Total	Residential Vocational Training Program Personnel	Residential Vocational Training Program Total
1979	239.1	241.8	---	---
1980	225.7	304.0	54.5	59.2
1981	269.3	358.7	124.7	205.8
1982	304.2	396.0	165.1	251.4
1983	328.4	414.3	149.1	202.3
1984	372.0	451.1	124.1	219.7
1985 (budget)	433.8	563.3	204.3	313.4

SOURCE: Staff, Kodiak Mental Health Center.

Cultural Dynamics 1986

State grants and programs are currently the largest source of revenues for the Kodiak Island Borough. Since major elements of state grants to municipalities were discussed earlier, they will not be examined here in detail. However, to reiterate, these state programs include State Shared Revenues, Municipal Assistance, and Shared Taxes.

Other major revenue sources include local taxes, investment earnings and others (e.g., fines and forfeitures), transfers from other funds, and federal revenue sharing. Amounts from these sources are summarized for the last three fiscal years. See Table 174. The category Transfers from Other Funds is totaled separately because a major portion of this is also comprised of state revenues for such restricted program usage as mental health, capital project funds, and local service roads and trails.

Using the subtotal as a base, local taxes comprise approximately 31 percent of revenues over the last three fiscal years. These tax sources are detailed in Table 175. Real and personal property taxes comprise the bulk of collections. Motor Vehicle Registration is included here as a tax although Borough publications treat it as an intergovernmental receipt. This tax is, however, equivalent to a personal property tax on motor vehicles. Although the rate schedule is set in state statutes and it is collected by the state, it is imposed at the option of the local government and revenues in excess of collection costs are transmitted to the locality. In other words, it is a local tax collected for the locality by the state. Thus, property taxes account for about 97 percent of local tax revenues, 70 percent from taxes on real property alone.

Particular emphasis is placed on tax revenues as a source here since state and federal contributions are covered elsewhere. A review of the role of local taxes as a revenue source in earlier years shows a steady decrease in their importance. In fiscal year 1979, taxes were 68.8 percent of revenues, declining dramatically until FY 1983, at 29 percent. The flip side of this decline is the rise in the importance of burgeoning state revenues,

TABLE 174

Kodiak Island Borough
Revenues ($000)

	FY83	%	FY84	%	FY85(Budget)	%
Taxes	$1,635.5	29.0	$1,687.8	32.3	$1,680.6	32.6
Intergovernmental	2,926.6	52.0	2,798.5	53.7	2,756.5	53.5
Investment Earnings (and others)	856.5	15.2	466.3	8.9	415.9	8.1
Licenses & Permits	45.4	.8	34.8	.7	31.3	.6
Federal Revenue Sharing	166.7	3.0	228.4	4.4	268.0	5.2
Sub-Total	$5,630.8	100.0	$5,215.8	100.0	$5,152.3	100.0
Transfers from Other Funds	406.3		960.8		1,210.4	
Use of Fund Balance	-0-		-0-		1,048.0	
Total	$6,037.2		$6,176.6		$7,410.7	

SOURCE: Kodiak Island Borough documents.

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TABLE 175

Kodiak Island Borough
Tax Collections ($000)

Taxes	FY 1983	FY 1984	FY 1985 (Budget)
Real Property	1,080.1	1,151.6	1,215.9
Personal Property	382.2	324.4	247.9
Motor Vehicle Registration	159.8	165.3	68.1
Penalties and Interest	51.8	29.8	30.0
Boat Tax	15.6	16.7	18.8
Total	1,689.5	1,6876.8	1,680.6

NOTE: Total taxes for FY83 differ slightly from those shown in Table 49. Numbers were from unaudited sources.

SOURCE: Kodiak Island Borough documents.

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as intergovernmental sources climbed in importance from 15.3 percent of revenues in FY 1979 to over 50 percent in FY 1983. If federal revenue sharing is added to other intergovernmental receipts, they comprise nearly 59 percent of revenues budgeted for FY 1985 (see Table 174). A further analysis of the categories "Transfers from Other Funds" and "Fund Balance" would raise this percentage even further.

City of Kodiak

The City of Kodiak is responsible for local governmental functions within the boundaries of the municipality. These functions include general government (mayor and city council, city clerk, finance offices); public safety (police and fire departments); public works (administration and buildings, engineering, water and sewer utilities, streets and snow removal, and equipment); parks and recreation, museum and library. The city had 125.5 full-time equivalent positions in FY84 with salaries and benefits of $4,331,309, which is 68 percent of general fund expenditures. This high percentage is indicative of the city's emphasis on direct service provision. Table 176 gives the City of Kodiak's employment history for the past several years.

TABLE 176

City of Kodiak--Employees

	Fiscal Year		
	(Budgeted) 1985	1984	1983
General Government (includes Legislature)	19.5	19.5	20
Public Safety	52	52	52
Public Works	24.5	25.5	25
Parks, Recreation, Library	13	10	13
Other*	17.5	18.5	19
	126.5	125.5	129

* Other includes cargo terminal, boat harbor, ferry shuttle.

SOURCE: City of Kodiak, FY84 Budget, FY85 Annual Budget.

Table 177 shows city expenditures by program for the last five years, plus FY75 for comparison purposes. City expenditures peaked in FY82, increasing at a nominal rate in excess of 19 percent between 1980 and 1982, or a rate of 12.5 percent adjusted for inflation. When spending declines in FY83 and FY84 are considered, expenditures have grown at an annual average rate of 8.9 percent in nominal dollars, or 2.5 percent adjusted, since FY80. Between FY75 and FY80, expenditures increased 140 percent (annual growth rate of 19 percent in nominal terms, 9 percent in real terms). Since FY80, city expenditures have increased most dramatically in the public safety category (average rate of increase, 18.4 percent) and parks, recreation, and library (19.8 percent). The increase in spending for police and fire is particularly significant since this category--public safety--comprises over 40 percent of the general fund budget.

City revenue sources as shown in Table 178 are not unlike those of the Kodiak Island Borough. Interfund Charges includes transfers to the general fund from special accounts such as the Cargo Pier Revenue Fund, Boat Harbor Fund, Water and Sewer Utility Fund. These transfers are payments in lieu of taxes and service charges. This interfund category also includes transfers from accounts set up to receive federal funds, such as federal revenue sharing and HUD block grants.

State sources of operating revenue range from 17 percent of total general fund sources in FY 1980 to 35 percent in FY84. Local taxes (property and sales) comprised 32 percent of general revenues in FY80 and 36 percent in FY84. If interfund charges are excluded from this calculation (special funds included vary among years making the results somewhat misleading), state sources comprise 28 percent of remaining revenues in FY 80 and 40 percent in FY84; while taxes comprise 52 percent of these revenues in FY80, and 41 percent in FY84. Kodiak city imposes both a sales tax and property tax, and appears less strongly state-dependent for operating expenditures than are many municipalities.

Federal revenue sharing as shown in Table 178 is the sum of the amount received by the city during the fiscal year plus the amount owed the city (not yet received). These amounts differ from the amount of revenue sharing transferred to general funds and expended during that fiscal year. This amount is included for informational purposes and is a non-add category, since funds from this source are included in Interfund Charges when transferred from their special account. It should be noted, however, that receipts from this federal program are a significant source of revenue to the city--6 percent of general fund revenues in FY80 and 10 percent in FY84.

Village Government

Village government funding is not discussed in detail here. The major local government employment is associated with the schools, which were covered earlier under state grants. Other major sources of funds for local government operations are state and federal monies which also are discussed elsewhere. The significance of public expenditures in local job markets is

TABLE 177

City of Kodiak
General Fund Expenditures ($000)

	FY 1984	FY 1983	FY 1982	FY 1981	FY 1980	FY 1975
General Government	665.6	613.5	728.1	726.3	610.0	264.0
Public Safety	2,660.8	2,475.4	2,213.6	1,662.1	1,352.1	662.2
Public Works, Engineering	1,527.5	1,566.0	1,299.9	1,227.0	1,167.7	550.2
Parks, Recreation, Library	683.6	591.8	513.9	431.5	332.0	84.3[2]
Nondepartmental	734.8	819.4	1,583.5	1,278.3	986.0	311.4
Debt Service[1]	93.7	92.6	75.3	78.0	80.7	11.8
	6,366.0	6,158.7	6,414.3	5,403.2	4,528.5	1,883.9

[1] Additional debt service is paid with special assessments and special revenue.
[2] Library only.

SOURCE: City of Kodiak, Financial Statements, FY75 and FY80-FY84.

TABLE 178

City of Kodiak--Sources of Revenues
General Fund ($000)

	Fiscal Year				
	1980	1981	1982	1983	1984
Taxes	$1,773.4	$2,782.6	$2,519.0	$3,022.0	$2,801.2
State Sources	934.0	1,436.2	2,117.0	2,380.4	2,697.7
Licenses & Permits	21.1	24.7	26.8	50.0	63.0
Svc. Charges & Sales	468.0	615.9	680.4	778.8	752.1
Interest & Misc.	192.6	317.7	356.8	322.4	501.0
Sub-total	$3,389.1	$5,177.1	$5,700.0	$6,553.6	$6,815.0
Interfund Charges	2,204.0	1,102.5	1,239.8	1,613.8	941.1
Total	$5,593.1	$6,279.6	$6,939.9	$8,167.4	$7,756.1
Federal Revenue Sharing (non-add)	313.1	231.8	325.6	569.1	766.8

SOURCE: City of Kodiak, Combined Financial Statements, Fiscal Years 1980, 1981, 1982, 1983, 1984. Peat, Marwick, Mitchell & Co.

clear from Table 179. Since revenues to these communities are primarily intergovernmental, adding their expenditures to state and federal amounts would constitute double counting. The topic of the importance of local government employment in these communities is reviewed in Chapter IV.

TABLE 179

Community Government Employment

	1980[1]	1983[2]	1984[3]
Karluk	21 (75%)	16	
Akhiok	13 (72%)	11	
Ouzinkie	20 (47%)	19	
Port Lions	41 (54%)	44	
Old Harbor	29 (66%)	34	
Larsen Bay	51 (67%)	18	
Chignik	22 (32%)	11	13
Chignik Lake	23 (100%)	24	14
Chignik Lagoon	5 (45%)	4	7
Perryville	9 (75%)	12	9
Ivanof Bay	9 (100%)	5	2

[1] 1980 Census tapes; includes construction, public administration, professional, transportation, education, and communication and public utilities. Percent of total employment in parentheses.

[2] 1983 Community Profiles, number jobs (non-fishing).

[3] November 1984, field research, Nancy Yaw Davis.

LOCAL CAPITAL EXPENDITURES

Most of the capital expenditures of local governments involves the implementation of projects which are funded with state and federal monies. Those appropriations are discussed elsewhere and will not be reiterated here. Local governments do contribute some revenues to capital projects. Table 180 summarizes City of Kodiak revenue sources for several major categories of capital improvements. The importance of intergovernmental monies

TABLE 180

City of Kodiak - Revenue Sources for Major Capital Project Funds

	(1)	(2)	(3)	(4)	(5)
		Distribution by Revenue Source			
Fund Purpose/FY	Total Revenues ($000)	Fed/State Grants %	Fund Int. Earnings %	Sales Tax or General Fund %	Other* %
Street Improvement					
FY82	2,991.0	31.6	5.6	52.1	10.7
FY83	5,280.4	47.6	3.2	43.2	6.1
FY84	7,667.8	55.3		39.0	5.7
Building Improvement					
FY82	1,458.3	91.0	4.1	4.9	--
FY83	2,769.9	95.3	2.1	2.6	--
FY84	5,809.0	90.4	--	1.2	8.4
Water Source Expansion					
FY82	152.0	3.2	13.9	--	82.9
FY83	2,375.6	93.8	.9	--	5.3
FY84	2,935.5	96.1	--	--	3.9
Water/Sewer Line Const.					
FY82	666.2	76.0	4.5	--	19.5
FY83	1,912.4	91.6	1.6	--	6.8
FY84	3,119.0	95.8	--	--	4.2
Harbor & Port Dev.					
FY82	2,356.1	40.0	9.0	51.0	--
FY83	3,343.7	36.2	6.3	57.4	--
FY84	3,524.3	25.2		74.8	--
HUD Block Grant (Street Improvement)					
FY84	3,723.1	85.3	--	14.7	--

* Other sources of revenue include transfers from other funds, special assessments for street improvements, and private contributions.

SOURCE: City of Kodiak, Annual Budgets.

is directly reflected in column (2) Federal and State Grants. The availability of these funds also influences interest earnings (from funds received but not yet expended), transfers from other funds, and even sales taxes. Were it not for the preponderance of state funding of general local government operations, these sales taxes or other general fund revenues would likely have to be used in part for general operations, and there would be less available for street improvements and other local capital projects.

School construction is the main capital expenditure area for the Kodiak Island Borough. A summary of school construction was included in the previous discussion of state capital spending (see Table 168). As of June 1984, the Kodiak Island Borough had budgeted $47.6 million in school projects since September 1982. Several projects were still in the design phase with $9.1 million yet to be funded. Of the $37.0 million projects completed or in progress as of last June, the Borough had contributed over $1 million (2.8 percent) and had committed another $530.0 thousand.

Detailed information on Kodiak Island Borough participation in funding other local capital projects was not available for this study. However, KIB budget summary data indicate transfers from the general fund to capital projects funds of $247.9 thousand in FY84, and a budgeted amount of $380.0 for FY85.

Federal Expenditures

OPERATING EXPENDITURES

Expenditures by the federal government in the Kodiak/Shumagin region are also an important element of the economy. As discussed in the introduction, it is difficult to separate federal dollars from state and local programs since many federally funded programs are administered through these other levels of government. As a result, some of the important federally funded programs have been covered in earlier sections of this report (e.g. Energy Assistance, Food Stamps, Federal Revenue Sharing). An effort is made here to avoid double counting these expenditures.

Direct federal employment and payroll in Kodiak are given for 1983 and the first quarter of 1984 in Table 181. At 1983 and 1984 employment levels, civilian payroll was over $700,000 per month. A large share of the federal payroll (over 80 percent in 1979) is for civilian employees of the United States Coast Guard installation on Kodiak Island. Additionally, Table 182 shows the number of active duty military personnel in the Kodiak census area over the past several years, and payroll for 1980-1983. In 1982 and 1983, military payroll was in excess of $2 million per month.

An important source of information regarding federal expenditures is the Geographic Distribution of Federal Funds in Alaska series which, through federal fiscal year (FFY) 1980, was an annual publication of the Community Services Administration. The data contained in this series is based on government obligations, which measure liabilities when incurred rather than when expenditures are actually made. However, unless an obligation is for

TABLE 181

Kodiak Census Division
Federal Civilian Employment

1983	Average Number of Employees	Payroll	Average Annual Salary per Employee
1st Quarter	255	$2,245,526	
2nd Quarter	253	2,008,144	
3rd Quarter	261	2,228,313	
4th Quarter	244	1,922,225	
Total 1983		$8,404,208	$33,185
1984			
1st Quarter	239	$2,109,724	$35,309

SOURCE: Alaska Department of Labor, Employment, Wages and Contributions Report, Computer Printout, 1983, 1984.

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TABLE 182

Active Duty Military Personnel
Kodiak Island

Year	Number	Payroll ($000)
1970	1,491	
1971	1,294	
1972	682	
1973	680	
1974	682	
1975	877	
1976	866	
1977	976	
1978	897	
1979	892	
1980	1,098	17,316.0
1981	1,073	21,445.0
1982	1,010	25,152.0
1983	1,095	28,250.4[1]

[1] Author's estimate

SOURCE: Alaska Department of Labor. Payroll, Bureau of Economic Analysis, "Local Area Personal Income," computer printout various years; and "Alaska Economic Trends," September 1984.

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a multi-year project, obligations provide a fairly reliable indication of expenditures. In some cases the Community Services Administration uses allocation formulas to distribute funds geographically and the resulting figures are estimates, which, like all estimates, are subject to errors. Table 183 summarizes the data from this source for the Kodiak area.

The grants category includes aid to state and local governments, private organizations, and some programs that aid individuals, such as fellowships or research grants. In FFY80, major grant programs for Kodiak included Food Stamp Bonus Coupons, $681,000 (Dept. of Agriculture); and Highway Planning and Construction, $1.8 million (Dept. of Transportation).

TABLE 183

Kodiak Island
Federal Obligations of Funds by Department
FFY 1980 ($000)

Agency	Grant Funds	Other Federal Funds	Total	Indirect Support
Dept. of Agriculture	817	134	951	(6,341)
Dept. of Commerce	55	1,636	1,691	(140)
Dept. of Defense	--	468	468	
Dept. of Education	902	1	903	
Dept. of Energy	407	--	407	
Dept. of Health & Human Services	290	3,778	4,068	
Dept. of Housing & Urban Development	320	--	320	(469)
Dept. of Interior	343	853	1,196	
Dept. of Labor	933	254	1,187	
Dept. of Transportation	2,098	25,920	27,390	
Dept. of Treasury	361	1	362	(1,039)
Civil Aeronautics Board	--	413	413	
Environmental Protection	74	--	74	
General Services Admin.	--	44	44	
Office of Personnel Mgmt	--	758	758	
Postal Service	--	926	758	
Railroad Retirement Board		12	12	
Veterans Administration	--	396	396	(55)
FFY'80 Total	6,599	34,963	41,562	

SOURCE: Geographic Distribution of Federal Funds in Alaska, FY 1980, Community Services Administration.

The category entitled "Other Federal Funds" includes some personnel and other operating costs as well as direct payments to individuals. The largest entries here for Kodiak appear under the Department of Transportation: $2.4 million for acquisition, construction and improvements at the Coast Guard Station; $22.2 million for Coast Guard operating expenses; $555 thousand for Federal Aviation Administration operations. Other important components include NOAA operations, research and facilities, $1.3 million (Dept. of Commerce); Indian Health Services, $1.0 million; Medicare, $944 thousand; Social Security, $1.7 million (Dept. of Health and Human Services); Civil Service Retirement and Disability Fund, $758 thousand (Office of Personnel Management); and $926 thousand for the Postal Service Fund.

Indirect Federal Support includes the market value of donated commodities, acquisition costs of donated property, and the face value of contingent liability of guaranteed/insured loans. For Kodiak the largest entry is $6.3 million in Rural Telephone Loans and Loan Guarantee (Dept. of Agriculture). Other, much smaller, programs include $140,000 Fishery Vessel Obligation Guarantees (Dept. of Commerce); $398,000 Mobile Home Loan Insurance (HUD); $1.0 million interest on the public debt (Treasury).

The data, although quite comprehensive, does not clearly delineate grants to local and state governments and federal funds which flow through the state government. Some programs are allocated to the state capital or to the location of the head office of the administering agency. For example, in FFY80, the only Bureau of Indian Affairs funds allocated to Kodiak were $22,000 for road construction, while the statewide total for various programs was in excess of $9.2 million in grants and $66.3 million in other federal funds. Because of the importance of BIA activities in the study region, more detailed information was obtained through direct contacts with that agency.

The Geographic Distribution of Federal Funds in Alaska was last published for FFY80. There is no comparably comprehensive data source available for our use here. Federal Aid to States, an annual publication of the Treasury Department, shows expenditure totals for the state, not subregions. The U.S. Department of Commerce, Bureau of the Census, publishes the Consolidated Federal Funds Report, by county areas (Volume I) and subcounty areas (Volume II); however, this information is much less detailed than that previously compiled by the Community Services Administration. Table 184 shows the obligations and expenditures reported for Kodiak for FFY83. Although this gives some information for a more recent year, it does not contribute much to our understanding of federal impact in the Kodiak area. Volume II contributes only slightly more by showing the distribution of federal revenue sharing by place.

Table 197 gives an overview of the level of state spending in the Kodiak/Shumagin study area. The first column--Kodiak--includes expenditures in the urban areas and expenditures for which data was available only by census districts, election district, or other aggregation. Thus, some expenditures allocated to Kodiak actually took place in Kodiak Rural or in the East Alaska Peninsula villages. Columns 2 and 3 thus contain only those

TABLE 184

(A) Kodiak Region, Federal Expenditures and Obligations
FFY83 ($000)

	Total	Detail
Grants and Awards	$4,247	
General Revenue Sharing		$ 708.5
Salaries	7,428	
Direct Payments to Individuals	5,904	
Retirement and Disabilities		3,914
Procurement Contracts	12,543	
Defense Contracts		4,921
Other Expenditures	270	
Total	$30,391	
Indirect Assistance		
Guaranteed Loans and Insurance	(305)	

SOURCE: Consolidated Federal Funds Report, FFY 1983, Bureau of the Census, Vol. I.

(B) Sub-County Distribution of Grants and Contracts
FFY83

Location	General Revenue Sharing	Other Grants	Procurement Contracts
Kodiak	$569,094	$3,247,931	$6,063,000
Akhiok	1,280		
Larsen Bay	4,094	290,195	11,000
Old Harbor	5,840		
Ouzinkie	4,046		
Port Lions	3,570		
Balance of Area	--		6,436,000
Undistributed	120,588		32,621
Totals	$708,512	$3,538,126	$12,542,621

SOURCE: Consolidated Federal Funds Report, FFY 1983, Bureau of the Census, Vol. II.

expenditures which could be broken out by place. Therefore, more confidence should be placed in the sum of these columns than to any one separately. Taking this approach, we see that nearly $41 million in operating expenditures can be identified for this region. This amounts to over $3,000 per capita in operating expenditures alone for that year. This is undoubtedly a conservative estimate of actual spending, since it was not possible to identify all program expenditures by place. Also, the payroll figures in Table 197 do not include employee benefits such as health and life insurance, which add over 25 percent to personnel costs.

Given the data problems associated with federal expenditures by place, an alternative approach is to look at federal funding from the viewpoint of the recipient. This has already been done somewhat by examining federal revenue sharing funds from both the distribution and local revenue sides. The Kodiak Area Native Association is the recipient of federal grants and contracts from several agencies. Over the years FY79-84, direct federal funds have comprised from a high of 95.6 percent to a low of 73.2 percent of KANA's revenue, for an average of 83.2 percent for the period. Since FY81, state funds have accounted for an average of 8.9 percent of KANA's revenues. A summary of KANA's revenues by source is provided in Table 185. The final category "Other" includes receipts for dental and medical services as well as grants which although from other organizations (e.g., the Southern Region Emergency Medical Services Council, Inc.) are probably also of state and/or federal government origins.

TABLE 185

Kodiak Area Native Association
Funding History 1979-1984

	Federal	State	Other	Total
FY79	2,022,537	0	93,868	2,116,405
FY80	2,618,976	0	161,362	2,780,339
FY81	3,118,352	116,281	373,211	3,607,844
FY82	2,581,527	237,907	422,384	3,241,818
FY83	2,390,606	478,684	392,700	3,267,990
FY84	2,578,199	364,016	448,260	3,390,475

SOURCE: KANA

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The breakdown of federal grants to KANA by department is given in Table 186. The total received by KANA in FY83 ($2.4 million) is less than the grants to Kodiak (exclusive of general revenue sharing) for that year as reported in the Consolidated Federal Funds Reports ($3.2 million). We assume the Consolidated Federal Funds Reports includes the KANA grants and thus is our more comprehensive (although less detailed) source.

TABLE 186

KANA Federal Revenues by Agency/Program ($000)

Agency	1980	1981	1982	1983	1984
	Fiscal Year				
Health & Human Services (HEW)	1,088.8	1,724.9	1,528.8	1,471.8	1,534.8
Bureau of Indian Affairs	768.4	809.8	522.2	574.4	825.4
Commerce, Econ. Dev.	144.1	60.7	57.0	74.3	44.0
Education	--	--	72.2	50.8	39.7
Job Training Program Act (CETA)	615.5	521.1	339.6	202.3	114.3

SOURCE: KANA

The Bureau of Indian Affairs was contacted directly for grant information by location. The majority of BIA funding is through KANA as discussed above, and perusal of grant applications did not contribute materially to our understanding of where the funds were actually expended. BIA and KANA records do provide additional detail on program types. Table 187 shows BIA funds granted to KANA by program for FFY82-84, and totals for FFY79-81. BIA files did reveal one grant type--Indian Self Determination Grants--with designated amounts by villages. The purpose of these grants is to strengthen tribal government operations and management, thus contributing to local self determination.

TABLE 187

Bureau of Indian Affairs Revenues to KANA ($000)

FFY	Total	Soc.Ser.,Housing Improvement, Employment Asst., Tribal Operations, Other	Johnson O'Malley	Training P.L. 93-638	Indian Child Welfare
1979	601.5				
1980	768.4				
1981	809.8				
1982	522.2	182.5	178.8	19.6	141.3
1983	574.4	280.4	121.9	33.6	138.6
1984	825.4	483.5	218.1	36.0	87.9

SOURCE: Kodiak Area Native Association, Financial Statements FY79-84.

It appears that in some years KANA has administered these grants for some communities (e.g., Karluk, Akhiok and Kodiak in FFY83) while in other years funding has gone directly to the local tribal entities.

TABLE 188

BIA-Indian Self Determination Grants ($000)

	FFY80	81	82	83	84
Akhiok	10.2	9.9	10.7	11.1	10.2
Karluk	8.9	8.7	9.3	9.7	8.9
Kodiak	13.2	12.7	14.6	15.6	13.4
Larsen Bay	8.2	8.0	8.5	8.8	8.2
Old Harbor	12.5	12.0	13.7	14.6	12.5
Ouzinkie	9.0	11.7	12.7	13.3	12.0
Port Lions	13.0	12.7	N/A	14.6	13.1

SOURCE: Bureau of Indian Affairs Files

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The Alaska Peninsula villages receive the benefit of federal expenditures through the Bristol Bay Native Association (BBNA) and the Bristol Bay Area Health Corporation. Although a breakdown of expenditures by place was not available for use in this study, BBNA's financial report for FY 84 indicates federal contract revenue of nearly $1.5 million for that year. Programs provided with Bureau of Indian Affairs funding (which comprise slightly less than half of federal revenues) included employment assistance, higher education grants, social and child welfare services, training and technical assistance, and subsistence research. Other major programs included the Energy Assistance Program (covered under state administered transfer payments), Job Training Partnership Act (Department of Labor), Economic Development Program, Community Services Block Grant, Comprehensive Employment and Training Act, and Village Government Training Program. The only program for which we have an estimate of village expenditures is the Energy Assistance Program discussed under state transfer payments.

BBNA also received over a million dollars in state grants for a wide variety of programs. Here again we have no breakdown of expenditures by place. The largest single state program funded through BBNA is the Village Public Safety Officer Program. Bureau of Indian Affairs files indicated Indian Self Determination Grants to the East Alaska Peninsula villages as found in Table 189.

TRANSFER PAYMENTS

Although the Community Services Administration no longer publishes The Geographic Distribution of Federal Funds in Alaska, similar data is available for an important federal agency--the U.S. Department of Health

TABLE 189

Bureau of Indian Affairs
Indian Self Determination Grants
($000)

Location	FFY 81	FFY 82	FFY 83	FFY 84
Chignik	7.1	7.4	7.6	7.2
Chignik Lagoon	7.5	7.9	no grant	7.6
Chignik Lake	8.7	9.3	9.7	8.9
Ivanof Bay	6.4	not used	6.8	6.4
Perryville	8.9	9.5	no grant	9.1

SOURCE: BIA files.

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and Human Services. A departmental publication, Financial Assistance by Geographic Area, provides data on all of HHS domestic assistance programs. The major programs of interest here are social security and medicare.[4]

Social Security

Social Security payments are transfer payments to individuals. Social Security is directly administered by the federal government, in contrast to some of the categories of public assistance discussed earlier which are federally funded, but administered by the state and flow through state agencies (Alaska Department of Health and Social Services). Data on Social Security are available from the federal document referenced above (Financial Assistance by Geographic Area) and from the Census. Table 190 indicates obligation of funds by program type and location for federal fiscal years (October 1-September 30) 1980, 1981, and 1983.

All five of these programs involve direct payments to individuals with no restrictions placed on the use of the funds. The proration of funding for Supplemental Security Income is based on the number of recipients in each area as a proportion of total recipients statewide. The remainder of the program funds are distributed based on the ratio of 700 major cities in relation to the national total of benefit payments.

Census data on Social Security income are based on self declaration of income by type for a sample of residents. These numbers are thus subject to the same limitations as the public assistance data from the same source as discussed earlier. The Census recorded no income from Social Security in any of the Alaska Peninsula communities included in this study, nor in Cold Bay. The Kodiak Island total of $613,100 income from Social Security payments for calendar year 1979 is somewhat mystifying when compared with the $1.65 million allocated to the area using the Health and Human Services methodology for the period October 1979 through September 1980. Part of

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[4] Other transfer payment programs which are federally funded but state administered were covered earlier under state expenditures.

TABLE 190

Kodiak Island
Obligations of Social Security Administration by Program ($000)

	Federal Fiscal Year		
	1980	1981	1983
Supplemental Security Income (Payments to aged, blind and disabled)	73.5	92.6	101.8
Social Security-Retirement Insurance (Retired beneficiaries or dependents)	732.7	977.4	1,371.2
Social Security-Survivors Insurance (Retired beneficiaries or dependents)	655.9	655.3	648.6
Social Security-Disability Insurance (Disabled beneficiaries and/or dependents)	179.8	224.1	278.1
Special Benefits for Disabled Coal Miners (Disabled and/or dependents)	9.4	12.1	5.6
Total	$1,651.3	$1,961.5	$2,405.3

SOURCE: U.S. Department of Health and Human Services, Office of the Assistant Secretary for Management and Budget, Financial Assistance by Geographic Area, Region X, Fiscal Years 1980, 1981, and 1983.

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TABLE 191

Household Social Security Income by Community (1979)

Community	Total Social Security Income	Number of Households	Average SS Income of Receiving Households	% Income from Soc. Security of Total Income for Area
Kodiak	$468,290	142	$3,298	.84%
Akhiok	2,105	1	2,105	.83
Karluk	2,810	1	2,810	1.39
Larsen Bay	27,415	15	1,827	3.67
Old Harbor	4,435	3	1,473	.33
Ouzinkie	39,630	12	3,302	2.29
Port Lions	68,415	19	3,601	4.32
Total, Kodiak Island	$613,100	193	$3,177	

SOURCE: U.S. Bureau of the Census.

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this difference may reflect the exclusion of residents in road-connected areas outside the city boundaries from census data. Even combined with errors in the proration technique used by the Department of Health and Human Services, this discrepancy is disturbingly large.

Medicare

Two major types of medicare payments are reflected in the HHS publication. Medicare-Supplementary Medical Insurance provides insurance protection for individuals 65 or over and for certain disabled persons who elect this coverage. Payments are made either to the individual or to the service supplier. Medicare-Hospital Insurance provides for hospital coverage for specified uses to the same group of recipients. These payments are made to providers or intermediaries. The geographical distribution of funds was based on the ratio of program beneficiaries in the area to the statewide total of beneficiaries. This ratio, based on information provided by the state, is then applied to the total funds apportioned to the state. Combining medicare and social security payments for FY83 yields a total inflow of $4.38 million into the Kodiak area. As with social security, no information on medicare payments to the East Alaska Peninsula villages was available to this study.

TABLE 192

Medicare Obligations Kodiak Area ($000)

	Fiscal Year		
Program	1980	1981	1983
Supplemental Medical Insurance	292.8	354.6	608.0
Hospital Insurance	650.8	790.2	1,366.5
Total	943.6	1,144.8	1,974.5

SOURCE: U.S. Department of Health and Human Services, Financial Assistance by Geographic Area, Region X, FY80, 81 and 83.

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FEDERAL GOVERNMENT CAPITAL EXPENDITURES

A comprehensive source of data on federal capital spending was not available for this study. Our approach was to contact directly federal agencies which are known to have carried out extensive capital projects in the study region. This section presents the partial data which we were able to gather using this procedure. The agencies covered here are the Department of Housing and Urban Development, the Indian Health Service (which is in the Department of Health and Human Services), and the Economic Development

Agency (Department of Commerce). The Bureau of Indian Affairs also funds capital projects through non-profit organizations such as KANA and BBNA. We were not able to identify these projects by place; however, they are included in the totals shown earlier for the non-profit corporations.

The Department of Housing and Urban Development has been active in developing housing projects and related public facilities in rural Alaska. Table 193 summarizes HUD expenditures in the study region. A total of 227 units, costing $20.9 million have been constructed since FY79. Fifteen units for Old Harbor were out to bid, and an additional 30 units for Kodiak were expected to be bid at the time of this research. According to HUD documents, no projects were funded in the Alaska Peninsula villages. However, a fifteen-unit project for Chignik Bay was expected to go out for bid in 1985.

Table 193

Housing and Urban Development
Housing Projects--Kodiak/Shumagin Region

Community	FY-Construction	Total Units	Total Costs to HUD ($000)
Akhiok	1979	15	1,329.2
Karluk	1979	23	2,089.9
Larsen Bay	1979	15	1,329.2
Old Harbor	1979	45	3,990.5
Ouzinkie	1979	23	2,053.1
Subtotal 1979		121	10,791.9
Port Lions	1982	35	3,227.0
Ouzinkie	1982	10	922.0
Subtotal 1982		45	4,149.0
Kodiak	1983	48	4,408.6
Larsen Bay	1983	13	1,515.6
Subtotal 1983		61	5,924.2

SOURCE: Active Project Listing, 12/84, Department of Housing and Urban Development.

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HUD also administers several community grant programs, which are described in Table 194.

The Indian Health Service has been instrumental in providing the design and funding for water, sewer, and solid waste systems in rural Alaska. Table 195 describes recent projects of this type in the study region.

TABLE 194

Housing and Urban Development
Community Development Block Grants Awarded to the Kodiak Island Area--1975-1983

Type of Grant	Grantee	Activity	Fiscal Year of Grant Award	Amount of Grant ($)
E	Kodiak (city)	Water and sewer lines, storm drains, paving	75	436,000
D	Kodiak Is. Borough	Controlled sanitary land fill for seven communities	75	246,900
E	Kodiak	Paving & drainage in housing area; historic building restoration; mini park development	76	436,000
D	Kodiak Is. Borough	Industrial water supply	76	81,000
E	Kodiak	Paving & drainage in Aleutian Homes Subdivision	77	436,000
D	Kodiak Is. Borough	Electric system for Karluk and Akhiok	78	284,000
I	Karluk	Electrical improvements	78	40,000
I	Ouzinkie	Electrical distribution	78	200,000
I	Larsen Bay	Tribal facility	78	60,000
I	Port Lions	Water & sewer	78	63,215
I	Akhiok	Electrical distribution	78	25,000
I	Akhiok	Boat mooring facility	79	185,000
I	Port Lions	Road improvements	80	95,000
SC	Kodiak	Road	80	140,000
SC	Kodiak Is. Borough	Electrical distribution	80	85,000
SC	Kodiak	Comprehensive neighborhood development center	81	450,000
SC	Kodiak Is. Borough	Sewer & water	81	200,000
SC(S)*	Kodiak Is. Borough	Various projects	82	500,000
SC(S)*	Kodiak Is. Borough	Various projects	83	500,000
I	Larsen Bay	Electrical distribution	83	290,195

* State administered Small Cities program, State of Alaska DCRA.

E = Entitlement; D = Discretionary; I = Indian Tribes and Alaskan Natives; SC = Small Cities
SC(S) = Small cities program administered by the state after 1981.

Table 195

Indian Health Service Capital Projects--Study Region

			($000)		
Community	Fiscal Year	Project Description	IHS Funds	Other Funds	Total
Akhiok	1979-80	Water distribution system, M & O equipment	770.5		770.5
	1984	Repair water treatment plant	1.3	5.5	6.8
Karluk	1980	Community water system, sewer, & solid waste	700.7	97.1	797.8
Larsen Bay	1979	Water & sewer facilities	500.0		500.0
	1979	Complete water distribution system; construct sewage collection & treatment systrem; landfill & maintenance equipment	480.5	120.0	690.5
Old Harbor	1979	Water, wastewater, solid waste, maintenance	1,624.6	385.5	2,101.1
	1985	IHS engineering and technical services for renovation of system--capital grant $800.0, State			
Ouzinkie	1979	Water, wastewater, solid waste disposal systems	574.3	295.0	869.3
	1981-82	Water system extension, pumphouse, water intake	607.0	144.0	751.0
Port Lions	1981-82	Water, sewer, solid waste	1,493.0		1,493.0
Chignik Lake	1980	Water, sewer, solid waste	657.7		657.7
Perryville	1980	Water, sewer, solid waste	450.0		450.0

*Other funds shown when known.

SOURCE: IHS, Public Health Service, project files.

Since this information was derived from project files it is possible that not all relevant projects are identified in this table. When possible, the dollar figures represent actual costs rather than obligated amounts. Other communities have received state funding for water and sewer systems. In FY85 Chignik Bay was appropriated $578.0 thousand, and Chignik Lagoon, $728.0 thousand for this purpose.

Table 196 lists public works projects funded by the Economic Development Administration in the study region over the past five years. Total funding for these projects was $1.7 million. EDA also provides grant money for economic development planning. Planning grants have been awarded to the Kodiak Area Native Association, averaging about $55,000 annually over the past several years. Although this inventory of federal capital expenditures is brief it may capture over 90 percent of federal expenditures for infrastructure in the rural portions of the study region. Additional federal funding of capital items (e.g., roads, airports, harbors) has already been included in the listing of state appropriations that are federally funded.

TABLE 196

Economic Development Administration
Public Works Projects

Date	Location	Project Description	Amount ($000)
FY81-82	Kodiak	Water storage, water lines, street improvements	480.0
FY82	Kodiak	Shelikof Road improvements	80.0
FY85	Kodiak	Industrial Fishwaste Plant (state share additional $820.0)	670.0
FY82	Port Lions	Industrial Sewer Line (local share additional $25.3)	480.7

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Summary--Public Sector Activity, 1983

A note on the presentation of data in this section of the report seems appropriate. To our knowledge, there has been no equivalently detailed and comprehensive study undertaken of public expenditures in a region of Alaska. As discussed in the introduction, data are not routinely kept by location. As a result, this survey required substantial research effort and produced and compiled information not previously available in one place. Data was obtained from many sources and was often not available for a standard time period (our original intent was to gather data from FY78 through FY84). Instead of deleting specific program information in favor of time series consistency, we have chosen to present the information for longer or shorter periods according to its availability. Thus, although we have not been able to construct a complete time series, data on specific programs may be useful to analysts and researchers pursuing related topics.

Because of the lack of a standard time period, summary data is presented for 1983. This is the most recent year for which the preponderance of information was available. The time series data presented throughout the report strongly support the hypothesis of the growing importance of the public sector. The summary data for 1983 give a measure of the relative level of public sector spending in the study region. Further FY83 state expenditures are near the peak in real terms, and thus provide a benchmark with which to compare future changes in the state role in the region's economy. These figures will be found in Table 197.

TABLE 197

State Expenditures--Partial Allocation[1]
Kodiak/Shumagin Area--1983 ($000)

	1 Kodiak	2 Kodiak Rural	3 East AK Peninsula	4 Total	5 Cold Bay
Payroll	8,565.6	--	--	8,565.6	624.8
Other Operating	4,390.0	32.8	16.5	4,439.3	218.7
Grants[2]	15,304.2	3,409.0	1,444.0	20,157.2	547.9
Transfer Payments	6,735.1	733.1	267.5	7,735.7	87.3
Total Operating	34,994.9	4,174.9	1,728.0	40,897.8	1,478.7
Indirect[3]	14,876.6	180.0	--	15,056.6	--
Capital	19,238.0	490.0	254.7	19,982.7	1,800.0

[1] Includes expenditures which could be allocated by place. Capital is appropriated funds as opposed to expenditures.

[2] Grants include School Foundation Support. Twenty-five percent of Kodiak Island Borough School District state funds for education allocated to Kodiak Rural. Also includes grants to municipalities and nonprofit organizations. Data are incomplete.

[3] Indirect includes Power Cost Assistance Program and loans made in that year. Excludes student loans and Commercial Fish and Agriculture Bank loans because our data for those programs is total outstanding balances as opposed to dollar volume of loans each year.

Capital appropriations for the Kodiak/Shumagin area were approximately $20 million in FY 1983. Cold Bay received another $1.8 million in appropriations. Although expenditure of these funds occurs over several years, the impact on the local economy is substantial.

Data shown for the Alaska Peninsula villages is clearly partial. The major items included in total operating expenditures are an estimate of School Foundation Support, Permanent Fund Dividend payments, Public Assistance, Energy Assistance, and State Revenue Sharing. Since none of these villages was incorporated in time to receive payments in FY 1983, no Municipal Assistance is included. (Chignik Bay is now receiving Municipal Assistance and Raw Fish Tax.) The largest omission from the Alaska Peninsula totals are grants made to nonprofit organizations which are expended in or to benefit various communities. In particular, for this region the Bristol Bay Native Association and Bristol Bay Area Health Corporation received close to $1 million in state grants. The proportion spent in the villages included in this study was, however, not available.

A similar problem exists in the data on transfer payments. Although Permanent Fund Dividend payments, Public Assistance and Energy Assistance are available by place, the Longevity Bonus is reported by House election districts. The House district approach aggregates payments to individuals in Kodiak, the Kodiak villages, and the East Alaska Peninsula villages. Loan data, which comprise most of the "indirect" expenditures column, are also reported by House election districts.

Capital appropriations for the East Alaska Peninsula villages in 1983 were $254.7 thousand. That amount was well below the $ 3.0 million in FY82 and $1.7 million in FY84. As noted above, since capital expenditures occur over several years, the FY 1980-1985 average appropriation of $1.4 million is probably a more accurate indicator of the amount of capital spending in the region.

Indirect state spending in the study area was over $15 million in FY83. Over 75 percent of this category is comprised of subsidized housing loans by the Alaska Housing Finance Corporation and the Housing Assistance Division of the Department of Community and Regional Affairs. Another major portion of this category (21 percent) is in the form of fishing and other business loans. Energy loans are .3 percent of the total, while electrical power price subsidies (power cost assistance) comprise about 3 percent of the indirect category. The electric rate subsidy involves a net flow of funds into the region although it is paid to the utilities and then passed on to consumers in the form of lower prices.

However, the loan funds cannot be viewed as equivalent to other state expenditures, since loans carry with them an obligation of repayment and thus an eventual outflow of funds from the region. These loans do have a net positive impact on the local economy, since by lowering the cost of capital by subsidizing the interest rate, more investment occurs than would have in the absence of these subsidized loans.

Within the scope of this study, it was not possible to calculate the amount of subsidy involved, so the principal amount of loans made per year is shown but not totaled with capital and operating spending. The summary does not include student loans and loans by the Commercial Fishing and Agriculture Bank since our data from those sources reflects total principal outstanding rather than yearly loan activity. As noted earlier, most loan data were by election district and thus loans in the East Alaska Peninsula and Kodiak villages are included in column 1, Kodiak.

Table 198 presents our estimate of direct federal spending in the Kodiak/Shumagin region in 1983. Additional capital spending is discussed below. We have attempted to avoid double counting by reducing the total by federal spending through state government. In particular, spending on public assistance and energy assistance which are both administered by the state are also reported in federal spending documents by place. Many federal programs which are statewide in nature are not presented in location specific summaries, but instead are allocated to state capitals. Many of those program expenditures are captured in state spending data and are not included in Table 198.

TABLE 198

Federal Expenditures (Partial)[1]
Kodiak Region--FY83
($000)

	Civilian	Military	Total
Payroll	8,404.2	28,250.4	36,654.6
Grants			7,780.2
Other			12,401.6
Subtotal			56,836.4
Deduct Programs Counted Under State Expenditures			
Public Assistance			-391.1
Energy Assistance			-115.7
Subtotal			56,329.6
Additional Capital Spending Excluded from CSA data[2]			6,266.2
Total Estimated			62,595.8

[1] Includes expenditures allocated by place in *Geographic Distribution of Federal Funds in Alaska*, FY80, Community Services Administration. Actual 1983 figures are used for payroll. Other categories adjusted to reflect inflation between 1980 and 1983.

[2] This category includes capital projects identified separately, allocated to the state capital in the source used above. Federal capital spending through state government (e.g., federal highway funds) is included in state spending and is therefore excluded here.

The importance of the Kodiak Coast Guard Station is striking. Coast Guard payroll alone accounts for over 45 percent of the federal expenditures identified. Also, much of the civilian payroll is Coast Guard related. The total figure includes estimated operations costs for the Coast Guard Station. Thus in excess of 60 percent of the federal expenditures discussed here appear to be Coast Guard related.

Data on federal spending in the Alaska Peninsula villages were not available, with the exception of Bureau of Indian Affairs Self Determination Grants which amount to $24.1 thousand in FY83 and $39.2 thousand in FY84. Other federal spending occurs through nonprofit organizations such as the Bristol Bay Native Association or through the state. No income from Social Security was reported in the 1980 Census for these communities. Public assistance (federally funded but included in state totals) was $4,539 for these villages in October 1983. If October were an average month, funds from this source would amount to nearly $54.5 thousand for the year.

Federal activities (especially capital projects) in the study area by three major agencies (Housing and Urban Development, the Economic Development Agency, and the Bureau of Indian Affairs) are not fully reflected in the data from the Community Services Administration summarized in Table 198. Although HUD Block Grants are included in CSA data by place, HUD housing projects, which amounted to $5.9 million in FY83, are not. EDA capital expenditures are excluded from the CSA compilation, and so the annual average of $342 thousand (FY81-85) is added to the total on Table 198. Bureau of Indian Affairs spending through KANA is not included in the CSA data (it was allocated to Juneau, the location of the main BIA office).

Accounting for these adjustments among data sources yields an estimate of about $62.6 million for federal spending identified in the study region. Again, this does not include federal spending which was passed through state government and is contained in state totals discussed earlier. Nor does this include (because of lack of data) federal spending in the East Alaska Peninsula villages (primarily through BBNA and BBAHC) or in Cold Bay.

Together, identified state and federal expenditures and obligations in the region (including Cold Bay) totaled close to $127 million for FY83. This number can be viewed as a conservative estimate, since data availability tended to result in exclusions rather than additions. For the most part, these funds are generated outside the study region and thus serve as an injection to the local economy. State taxes are minimal, however 1982 federal individual income taxes paid by returns from Kodiak were approximately $19.3 million.[5] These taxes represent a leakage from the economy.

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[5] Alaska Department of Revenue, "Federal Income Taxpayer Profile, 1978, 1981, 1982," March 1985.

Local government, when spending funds from external sources (intergovernmental funds), is a participant in the injection to local economic activity. This is probably most obvious in cases of local government management of state or federally funded construction projects. However, where local government provides goods and services funded through local taxes and fees we see a recycling of funds rather than a net injection, with its multiple impacts, to the economy. Intergovernmentally funded activities are included in the state and federal expenditures discussed above.

To fund additional activities local governments collect taxes and fees. These taxes and fees reduce local disposable income and thus reduce local private consumption and saving. Thus, what we expect to see is a different combination or composition of goods and services produced and consumed (a different public/private mix) rather than a different total level of expenditures resulting from locally funded local government activities. One possible way in which these "internally" funded public expenditures might make a net addition to the level of production is if these public activities have a lower import component. That is, if the public expenditures displace private spending which would have occurred outside the region or with a higher level of leakage, the total level of local economic activity may be greater with than without the locally funded public sector production. We do not have the information to investigate this question. Thus, since the portion of local expenditures which serves as an injection to the economy has been included in the state and federal spending, local expenditures will not be reexamined here.

The total of $127 million of identified state and federal spending in the study region in one year gives a sense of the magnitude and importance of public sector activity to the regional economy. As noted earlier, $127 million is a low end estimate, since expenditures which could not be allocated by place are omitted. The state/federal split of expenditures is 51 percent state and 49 percent federal, with federal spending predominantly Coast Guard related. If federal spending in Cold Bay and the East Alaska Peninsula villages were more fully accounted for, the split would likely tip in favor of federal spending. Assuming the retention of the Coast Guard installation, federal spending in the region can be expected to be more stable than state spending over the next few years. Although federal activities are more stable, they also have a smaller impact on the local economy due to leakages associated with on-base purchases and housing options for Coast Guard personnel.

The final summary indicator of the importance of public sector activity in the study region is direct and indirect government employment. Table 199 shows estimates of public sector jobs in the study region. Given the Department of Labor's estimate of total non-agricultural employment for Kodiak Island and the employment estimate developed in this study for fishing and fish processing, and the Coast Guard, direct public sector jobs were approximately 26 percent of total employment in 1983, while direct plus indirect employment were in the range of 34 percent of total employment. Although comparable employment data for the Alaska Peninsula villages is not available, it is likely that these percentages are even higher for that area. Any future economic trends in the region must carefully consider the impact of a changing level of public sector activity in the area.

TABLE 199

Kodiak/East Alaska Peninsula
Public Sector Employment--1983

	Government Jobs	Externally Generated Government Jobs[1]
State	248	248
Federal (civilian)	253	253
Kodiak Island Borough	44	28
Kodiak City	129	49
Kodiak Island School District	331	300
Lakes & Peninsula REAA[2]	38	38
Village Government[2]	64	61
Subtotal (civilian)	1,107	977
Federal--Coast Guard	1,095	1,095
Total	2,242	2,115

Indirect Employment[3]	
Government Support	262
Construction	402

[1] Local government and school estimates are based on the share of total revenues from state and federal sources.

[2] See Chapter IV for discussion.

[3] Alaska Peninsula government employment estimate is 56--38 school employees and 18 village government employees.

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VI. OUTDOOR RECREATION AND TOURISM

by Richard Krause, M.A.

This chapter provides a description of outdoor recreation and tourism in the Kodiak/Shumagin region. First is a brief narrative inventory of the resources and management philosophies of the various agencies. Next is an examination of user behavior. Third is an analysis of some of the economic implications of outdoor recreation and tourism.

Resources and Management Philosophies

ALASKA STATE PARKS

On Kodiak Island there are four major park units: Shuyak Island State Park, Fort Abercrombie State Historic Park and National Historic Site, Buskin River State Recreation Site, and Pasagshak River State Recreation Site. Shuyak Island State Park is a recent acquisition, still in the planning and development stage. Responsibility for management of the Alaska State Park System is vested with the Alaska Division of Parks within the Department of Natural Resources.

The following goals are the basis for managing the park units:

- Provide for the outdoor recreational needs of present and future generations.
- Preserve and protect areas of natural significance.
- Preserve and interpret Alaska's cultural heritage.
- Protect and manage areas of significant scientific or educational value.
- Provide support to the state's tourism industry.

These goals constitute the management philosophy for the entire state park system (State of Alaska Park System: Statewide Framework 1982:3).

Fort Abercrombie State Historic Park and National Historic Site

Fort Abercrombie is located on a rain-forested peninsula, 4.3 miles from Kodiak. A coastline of dark cliffs surrounds the peninsula. Stands of Sitka Spruce, rain-forest undergrowth, and a wide variety of flowering plants are abundant in the area. Gertrude Lake (more commonly known as Abercrombie Lake) is a popular picnicking and fishing area. Within a few feet of the outlet of the lake, fishing is possible in the Pacific Ocean. Campsites, group activity areas, and historical features (bunkers, gun emplacements, etc.) are additional recreational attractions.

Buskin River State Recreation Site

Buskin River State Recreation Site is located four miles from Kodiak. The beach at the river mouth and the Buskin River are the primary features of the site. The most popular activity is sport fishing for salmon, which is excellent. Campsites, picnic sites, and remnants of World War II military installations are located at the site.

Pasagshak River State Recreation Site

Pasagshak River State Recreation Site is 45 miles from Kodiak. The primary feature of the site is the mouth of Pasagshak River, where excellent sport fishing for salmon and Dolly Varden are found. Camping and picnic sites are located here.

Other Sites

In addition to the state parks near Kodiak city, there are other resources with significant heritage, wilderness, recreation, and scenic values. Approximately 50 Coastal Areas of Particular Concern have been identified within the Kodiak/Shumagin area (State of Alaska Division of Parks 1980: 1-297). All of these provide a diverse environment for recreation. Specific inventory and management recommendations for these resources have been completed by the Division of Parks in conjunction with the Alaska Coastal Zone Management Program.

U.S. FISH AND WILDLIFE SERVICE

The U.S. Fish and Wildlife Service within the Department of Interior has the management responsibility for the Izembek National Wildlife Refuge, Alaska Peninsula National Wildlife Refuge, and the Kodiak National Wildlife Refuge. These three units are diverse natural resource areas encompassing approximately 6.4 million acres.

Various legal, administrative requirements, and regulations govern their management. Among these are migratory bird treaties with Japan, Mexico, Canada, and the USSR, and the Convention of Nature Protection and Wildlife Conservation in the Western Hemisphere. These treaties emphasize the management and protection of individual species, and the protection of specific ecosystems and habitats. The National Wildlife Refuge System Administration Act of 1966, the National Environmental Policy Act of 1969 (NEPA), and the Alaska National Interest Lands Conservation Act (ANILCA) of 1980 are the legislative acts that provide for oversight.

The purposes of the refuges as defined by ANILCA are:

- Conserve fish and wildlife populations and habitats in their natural diversity.

- Fulfill international treaty obligations.

- Provide opportunities for continued subsistence use.

- Maintain necessary water quality. (U.S. Fish and Wildlife Service 1985)

Izembek National Wildlife Refuge

Izembek Refuge, on the southwestern tip of the Alaska Peninsula, embraces about 315,000 acres of wetlands, lakes, mountains, and tundra. A significant portion of the refuge (300,000 acres) has been designated as wilderness. Wolves, caribou, brown bear, and river otter are among the sixteen mammals found here. Thousands of shorebirds, ducks, and geese nest within the refuge. Four species of salmon spawn in the rivers, and harbor seals, sea otters, and sea lions live along the Bering Sea coast.

In 1982-83 the most popular public activities on the refuge were hunting, sport fishing, and driving vehicles on the road system. Driving on the roads could be for pleasure or for transportation between activities. The most frequent recreation activities are waterfowl, caribou, and bear hunting. It is estimated that 22 percent of the waterfowl are harvested by nonlocal hunters. Sportsman groups from Anchorage charter aircraft to Izembek for waterfowl hunting, and it is the most popular activity for local residents.

An alternating spring/fall hunting season and a registration permit season allow for bear hunting. The majority of the hunters within the refuge are not local residents. Generally, these nonlocal bear hunters use aircraft or boats as their method of transportation. Nonresidents of Alaska are required by law to hire a guide. By contrast, local residents use the 42 miles of roads within the refuge for their bear hunts. Most of the caribou hunting is adjacent to the refuge road system as well. Local residents are estimated to harvest 46 percent of the annual take of caribou. Only a small amount (5 percent) of the annual estimated ptarmigan harvest is taken by nonlocal hunters. There is an insignificant amount of sport fishing by the public within the Izembek Refuge; what little (95 percent) is done, is by local residents. The most popular species of fish are Dolly Varden, silver, pink, and chum salmon.

Alaska Peninsula National Wildlife Refuge

The Alaska Peninsula National Wildlife Refuge includes nearly 4.3 million acres stretching along southwestern Alaska's peninsula. The refuge has a variety of landscapes: wetlands, cliffs, lakes, tundra, fjords, and volcanic peaks. Wolverine, brown bear, caribou, moose, and wolves are some of the 30 species of mammals living within the refuge. Five species of salmon spawn there, and harbor seals, sea otters, and sea lions inhabit the Pacific Coast shoreline. Migrating waterfowl are found within the refuge's wetlands and lakes.

Trapping, fishing, and hunting are the most popular public use activities. Approximately 71 percent of the sport fishing is by nonlocal residents. Grayling, salmon, and Dolly Varden are the most popular species. Most public use is related to hunting. Multi-species hunts are possible within the northern section of the refuge; these can be for brown bear, moose, caribou, and waterfowl. Generally, the local residents harvest the largest numbers of these species. A significant amount of the harvest within the refuge is for subsistence uses. Other activities such as camping, photography, etc., are done in conjunction with fishing and hunting.

Kodiak National Wildlife Refuge

The Kodiak Refuge covers approximately 1.8 million acres on Kodiak, Uganik, and Afognak Islands. Rugged mountains, wetlands, and dense vegetation characterize the refuge. Thousands of shorebirds, geese, and ducks are found here; five species of salmon spawn in refuge streams. Steelhead, rainbow trout, and Dolly Varden are also located in these streams. Porpoise, halibut, seals, and whales inhabit the bays surrounding the refuge; brown bear, deer, and mountain goats are among the mammals within its boundaries. Thanks to these resources, the Refuge provides a wide variety of recreational and subsistence hunting and fishing opportunities. Brown bear hunting, deer hunting, and sports fishing are the most popular activities. A significant number of village and Kodiak city residents participate. Many individuals utilize the services of guides for hunting and sports fishing.

NATIONAL PARK SERVICE

The National Park Service within the U.S. Department of the Interior has management responsibility for Aniakchak National Monument and Preserve. Aniakchak encompasses an area of 580,000 acres and is located on the Alaska Peninsula between the northern and southern sections of the Alaska Peninsula National Wildlife Refuge. The preserve's most outstanding feature is one of the world's largest volcanic calderas. Inside the caldera, which averages six miles in diameter, are cinder cones, charred debris, and strange formations from past volcanic activity. During the summer two National Park Service employees from Katmai National Park are stationed at the preserve. The isolated location, hostile terrain, and violent weather discourage public use of the area. Only a small number of people have ever visited there (National Park Service 1984:1).

CITY OF KODIAK AND KODIAK ISLAND BOROUGH

The City of Kodiak and the Kodiak Island Borough support recreation facilities and opportunities for townspeople. The Borough primarily makes available its various school facilities, such as the high school gym and swimming pool. The Borough does not have the jurisdiction to operate parks and recreation programs within the city; however, it does promote and cooperate with the city in the operation of programs (KIB Coastal Management Program Progress Report Reprint 1983:159). The Coast Guard maintains recreation programs and facilities for personnel on the base.

Tourist Facilities

In Kodiak city in 1985 there were 4 motel/hotel facilities, 6 boat charters, and 8 air charter companies. The charter services were augmented by 10 fishing guides and 17 hunting guides who provided services to the Kodiak National Wildlife Refuge. Many Kodiak residents use their own private boats to provide transportation to fishing and hunting locations around the island, but the number of residents who do this is not known.

User Behavior

INTRODUCTION

Recreation and tourist behavior has been described in several surveys and public and private sector management documents. The data presented in the following sections are from these studies. Readers are cautioned that differing methods were used to gather the information summarized here.

Examination of the user behavior data suggests that fishing, hunting, and sightseeing are the most popular activities in the Kodiak/Shumagin region. The residents of Kodiak city indicate that outdoor recreation is an important reason for their coming and staying in Kodiak. On the other hand, the satisfaction of outdoor recreation compared to other factors (social, economic, community life) was rated lower by Kodiak residents (Alaska Public Survey: 1979). Two community needs perceived by the residents are lack of access and inadequate indoor recreation facilities (KIB Comprehensive Parks and Recreation Plan 1978:24-30 and Kadiak Times 1984). In responding to these perceptions, public and private agencies should find approaches that include more than just providing programs because these needs are important quality of life issues.

Tourism in Alaska has dramatically increased during the last several years (Alaska Visitors Association 1985:4; Alaska Outdoor Recreation Plan 1981:78), and an increase in tourism within the Kodiak region could provide an expanded economic base for the area. There are, however, several factors that complicate the picture. Recent legislation, such as ANILCA and ANCSA, has changed ownership, jurisdiction, and other elements of public land management.

Consequently, there are many conflicts and unresolved problems (see Table 200 for a listing of conflicts identified in government documents). Because outdoor recreation activities are popular, public and private land managers are seeking methods to reduce these conflicts. One possibility is the modification of user behavior; it has been shown more efficacious in alleviating user incompatibility than more traditional approaches such as limiting the numbers of users (Hendee 1974:104-113).

The findings of the various user behavior studies are presented in the following sections.

TABLE 200

Problems and Concerns for Land Management Units in the Kodiak-Shumagin Region

SIGNIFICANT POTENTIAL PROBLEMS IDENTIFIED FOR KODIAK REFUGE

* Development and use of inholdings
* Competition/conflict between resource users
* Brown bear/human conflicts
* Statis of water navigability
* Overutilization of resources by commercial activities, fish guiding, etc.
* Possible oil development impact
* Fishing sites utilized as hunting camps

Hydro site impact

PUBLIC USE ISSUES OF CONCERN

* Development impacts
* Land status (exchanges and inholdings)
* Management of brown bear
* Fisheries enhancement
* Wildlife studies
* Wilderness designation
* Regulation of use and law enforcement
* Public access
* Subsistence and quality of life
* Public use cabins
* Visitor education
* Refuge management

SIGNIFICANT POTENTIAL PROBLEMS IDENTIFIED FOR IZEMBEK REFUGE

* Intensive human use in sensitive habitiats
* Off-refuge commercial and sport harvest of adult salmon
* Disturbance of migratory bird populations
* Lack of resource data
* Development and use of adjacent and private lands

PUBLIC ISSUES OF CONCERN

* Protection of fish and wildlife
* Providing additional opportunities for access
* Oil and gas exploration and development
* Economic development in Cold Bay
* Potential refuge land exchanges

SIGNIFICANT POTENTIAL PROBLEMS IDENTIFIED FOR ALASKA PENINSULA REFUGE

* Intensive human use of sensitive fish and wildlife habitats
* Off-refuge harvest of adult salmon
* Lack of resource data
* Oil and gas development
* Development and use of adjacent state and private land
* Refuge inholdings

PUBLIC ISSUES OF CONCERN

* Management for the benefit of all species
* Protection of key wildlife areas
* Impacts of resource development on fish and wildlife
* Competition between various users
* Improving access
* Protection of historical and cultural resources
* Improved resource and user information
* Restrictive management of wilderness

SIGNIFICANT POTENTIAL PROBLEMS IDENTIFIED FOR THE STATE PARK SYSTEM ON KODIAK ISLAND

* Access across private lands to public lands
* Limited public lands along road system
* Lack of public recreation development

PUBLIC ISSUES OF CONERN

Develop marine park sites
Maintain public access
Preserve coastal character
Develop road-accessible recreational facilities

KODIAK CHAPTER ALASKA VISITORS ASSOCIATION

The Kodiak chapter of the Alaska Visitors Association conducted a survey to determine the public perception of tourism in Kodiak. It was similar to a statewide one conducted by Dittman Research (Alaska Visitors Association 1983:1; Fox:1985).

Thirty-nine percent of the respondents answered "yes" to the question, "Are problems caused by visitors?" Of these yes answers, harm to natural areas was considered by 35 percent to be most related to visitors. Slightly more than half (52 percent) believe that visitors come to Kodiak for sports fishing and hunting (see Table 201).

TABLE 201

Why do you think people visit Kodiak?

	Percent
Business	21
Hunting/sports fishing	52
Sightseeing	27

Cultural Dynamics 1986

A different question asked, "Do you favor or oppose the development of a visitor industry in Kodiak?" Eighty percent responded "favor" to this question. This suggests that Kodiak residents do desire the development of tourism; however, consideration should be given to the perception that some problems are caused by visitors.

ALASKA TRAVELER SURVEY AND VISITOR INDUSTRY ANALYSIS

A comprehensive statewide survey and visitor analysis was conducted from October 1982 through September 1983 (Alaska Traveler Survey and Visitor Industry Analysis 1983:1-287). Nonresident visitors to Alaska were interviewed and visitor-related industries were surveyed. Included here is the data from survey respondents who spent one or more nights on Kodiak Island. The methodology and limitations are discussed in the report of the statewide study. One limitation is the size of the sample of nonresident Kodiak visitors. Highlights from the analysis are as follows:

- An estimated 15,553 nonresidents visited Kodiak between October 1982 and September 1983.
- The most popular activities were sightseeing, visiting friends/relatives, and fishing.
- Visitors spent an estimated $12 million in Kodiak.

Demographics

The majority (68 percent) of the survey respondents were age 35 or older. Of these, 39 percent were age 55 or older (see Table 202).

TABLE 202

Age of Survey Respondents

Category	Percent
18 to 24	17
25 to 34	15
35 to 44	21
45 to 54	8
55 to 64	17
65 and over	22
	100

Cultural Dynamics 1986

This suggests that the majority of future nonresident Kodiak visitors could be middle-aged. Given the projected nationwide rapid increase of the middle-aged population, age structure factors should be kept in mind when planning for the Kodiak/Shumagin region.

Fifty-eight percent were college graduates, with another 21 percent having attended college (see Table 203). Nearly half indicated they had incomes of $30,000 or higher (see Table 204).

TABLE 203

Educational Attainment of Survey Respondents

Education Level	Percent
No high school	3
High school grad	18
Some college	21
College grad	21
Post grad	37
Total	100

Cultural Dynamics 1986

Over half (58 percent) of the nonresident Alaska visitors to Kodiak were from the states of Washington, Oregon, and California.

TABLE 204

Income Level of Survey Respondents

Income	Percent
Under $10,000	17
$10,000 to 14,999	11
$15,000 to 19,999	6
$20,000 to 24,999	10
$25,000 to 29,999	7
$30,000 to 34,999	2
$35,000 to 49,999	23
$50,000 to 59,999	8
$60,000 and over	16
Total	100

TABLE 205

Place of Residence of Visitor Parties to Kodiak

Location	Percent
Washington	27
California	24
Oregon	7
New York	4
Other	38
Total	100

Cultural Dynamics 1986

Transportation

Approximately 60,000 travelers went to Kodiak via domestic air between October 1982 and September 1983. This estimate was derived from the city airport manager and from CAB and ATC statistics (Civil Aeronautics Board 1985 and Alaska Transportation Commission 1985). Some of the respondents (20 percent) indicated that the ferry system and private auto were their modes of transportation while in Alaska. Assuming these visitors used the ferry system to visit Kodiak, the estimated breakdown of the means of transportation for nonresident visitors to Kodiak is as follows:

TABLE 206

Estimated Number of Visitors to Kodiak

	Oct-Dec	Jan-Mar	April	May	June	July	August	September	
Air	1,866	1,991	747	747	1,617	2,115	1,991	1,369	
Ferry	537*	-0-	258	258	475	600	569	413	Total
	2,403	1,991	1,005	1,005	2,092	2,715	2,560	1,782	15,553

* Percentage estimates extrapolated to respondents' totals; see also McKinnan:1984.

Cultural Dynamics 1986

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Activities

The three activities that nonresident Alaska visitors engaged in most were sightseeing, visiting friends/relatives, and sport fishing (see Table 207).

TABLE 207

Most Engaged in Activities Within Alaska
(Multiple responses requested)

Activity	Percent
Sightseeing	68
Visiting friends/relatives	43
Sport fishing	40
Visiting parks	37
Working	35
Camping/hiking	34
Museums/performing arts	34
Learning about other cultures	20
Pleasure boating	16
Business meetings	15
Looking for work	8
Hunting	6
Military	4
Conventions	2
Skiing	2
Winter sports	2

A follow-up question asked which one of the most engaged in activities constituted the main purpose for their trip to Alaska. The survey respondents indicated that sightseeing (27 percent) and visiting friends/relatives (31 percent) were the main purposes.

Information and Planning for Visits

The survey indicates that travel agents, brochures, and friends and relatives are the most popular sources of information about the region (Table 208). Magazines and television were where the visitors heard or saw advertisements about the state (see Table 209).

TABLE 208

Sources of Planning Assistance for Kodiak Visitor Parties

Category	Percent
Friends/relatives	47
Travel agents	41
Division of Tourism	15
Prior visit	25
Visitors bureau	4
Chamber of Commerce	6
Airlines	18
Brochures	25

TABLE 209

Advertisements Sponsored by the State of Alaska Seen or Heard by Kodiak Visitor Parties

Category	Percent
Newspaper	24
Magazine	37
Radio	10
Television	35
Other	3

Cultural Dynamics 1986

Expenditures

Nonresident visitors spent an average of $50 (including travel costs to and from Alaska) per person per night while in Alaska. This works out to an estimated total expenditure of $12,400,000 when in Kodiak. This estimate is obtained by assuming that 70 percent of all money spent on prepaid cruises and 80 percent of all transportation costs to and from the state never directly enter Alaska's economy. Then 57 percent of the total expenditure can be postulated as remaining within Kodiak, which is approximately $12 million (see Table 210 and Table 211).

TABLE 210

Nonresident Alaska Visitor Expenditures

Category	Total
Average Party Size	1.54
Average Expenditure Per Person	$2,628
Average Number of Nights in Alaska	37.95
Average Expenditure Per Person Per Night in Alaska	$69
Average Number of Nights in Kodiak	19.63
Average Expenditures Within Kodiak Per Person	$1,354
Number of Visitors to Kodiak	15,553
Total	$12,400,000

Cultural Dynamics 1986

TABLE 211

Estimated Average Dollar Expenditures for Nonresident Alaska Visitors to Kodiak

Category	Total
Transportation to and from Alaska (80% not in Alaska)	$ 171
Prepaid tour/cruise (70% not in Alaska)	195
Gasoline/auto repair	472
Car rental, taxi	109
Other transportation	387
Lodging	532
Food/beverage	367
Souvenir/gifts	438
Other, miscellaneous	235
Average Total per Nonresident Alaska Visitor Party	$ 2,906

Cultural Dynamics 1986

ALASKA PUBLIC SURVEY

During 1979 a multi-agency comprehensive survey was conducted throughout the state. The topics included recreation, subsistence, community attitudes, and related issues. The combined research effort involved the Alaska Division of Parks, Institute of Social and Economic Research, U.S. Forest Service, University of Washington, National Park Service, and Bureau of Land Management, Outer Continental Shelf Office (Alaska Outdoor Division of Parks and Recreation Plan 1981:19).

The following is a brief examination of the data from Kodiak respondents. They were asked to identify whether they considered various food gathering activities as recreation or subsistence.

TABLE 212

Recreation and Subsistence Orientation of Food Gathering Activities*

Orientation	Percent
Recreation	37
Subsistence	19
Both	44

*Hunting, fishing, crabbing, trapping, berrypicking, and plant gathering.

Participation in food gathering activities was considered a recreation activity by 37 percent of the respondents. Forty-four percent believe that food gathering activities are both subsistence and recreation. The residents were asked their reasons for being in Alaska. Of the three considerations for coming to or staying in the state, recreation was the most important (Table 213).

TABLE 213

Reasons for Coming to or Staying in Alaska

Reason	Percent* Important	Percent* Not Important
Living near water (R)	84	16
Long term economic gain (E)	89	11
Part of a small community (S)	71	29
Close to wilderness (R)	78	22
Immediate income gains (E)	71	29
Good hunting and fishing (R)	79	21
Recreation opportunities (R)	84	16
Escaping urban problems (S)	73	27
Independence, start new (S)	80	20
Challenging, exciting job (E)	76	24
Self reliance (S)	87	13
Close to friends/relatives (S)	54	46

* Ratings of important, very important, not very important, and not at all important collapsed to important and not important.

R = Recreation consideration
S = Social consideration
E = Economic consideration

Consideration overall averages:		
	Recreation	80%
	Economic	79%
	Social	70%

Cultural Dynamics 1986

The respondents were asked what they thought about living conditions in their community. It appears that the quality of outdoor recreation is not as satisfying as other aspects of community life (Table 214).

TERROR LAKE SURVEY

The Terror Lake hydroelectric project was constructed near Kodiak between 1982 and 1984. A survey was conducted by the Alaska Power Authority to determine the construction workers' activities and any possible impacts to the surrounding area (Alaska Power Authority 1985). Workers were asked where they lived before they took the job. The majority (59 percent) said they had lived in Alaska prior to Terror Lake employment (see Table 215).

Next they were asked "What town do you usually live in on your leave time or other time off work?" A majority (70 percent) of the workers spent their time away from the job within Alaska.

The most popular activities within 10 miles of the project site were fishing and boating. For these two activities, 44 percent of the workers participated in fishing and 40 percent in boating (Table 217).

TABLE 214

Satisfaction with Quality of Outdoor Recreation Compared to Other Aspects of Hometown

Aspect	Satisfaction Index*
Amount of fish (R)	1.8
Amount of game (R)	2.2
Number of available good jobs (E)	3.0
Number of available consumer goods (E)	2.8
Quality of transportation (C)	2.8
Quality of outdoor recreation (R)	2.0
Quality of water and air (C)	1.6
People help each other (S)	1.9
Quality of utilities (C)	2.4
Quality of police and fire protection (C)	2.1
Quality of schools (C)	2.2
Things to do around town (S)	3.0
Overall quality of community (C)	2.1

* The satisfaction index is the average individual's assessments with 4 = excellent, 3 = good, 2 = fair, and 1 = poor

R = Recreation consideration
S = Social consideration
E = Economic consideration
C = Community consideration

Consideration overall averages = R 1.9, E 2.9, S 2.5, C 2.3

TABLE 215

Residence Prior to Terror Lake

Residence	Percent
Kodiak	10
Mat-Su and other Alaska	10
Anchorage/Kenai	39
Other states	40

TABLE 216

Town Where Leave Time is Spent

Location	Percent
Kodiak	26
Mat-Su and other Alaska	6
Anchorage/Kenai	38
Other states	30

TABLE 217

Activities Participated Within Ten Miles of the Project Site

					How Often				
Activity	Percent Participation	No. of Times	%	No. of Times	%	No. of Times	%	No. of Times	%
Hunting	3	1-2	3%	3-10		11-25		25 more	
Fishing	44	1-2	8%	3-10	15%	11-25	13%	25 more	8%
Boating	40	1-2	10%	3-10	15%	11-25	10%	25 more	6%
Hiking	29	1-2	2%	3-10	13%	11-25	10%	25 more	5%
Camping	6	1-2	5%	3-10		11-25		25 more	2%
Water Sport	11	1-2	3%	3-10	6%	11-25		25 more	2%

Cultural Dynamics

A different question asked whether, during 1983 and 1984, the respondents hunted, fished, or trapped on Kodiak Island. A majority (80 percent) answered that they did engage in these activities. The workers also were asked if they participated in a series of other activities, including hiking, boating, and the like. Sixty-one percent said that they were involved in these types of outdoor recreation.

COMPREHENSIVE PARKS AND RECREATION PLAN

A survey was conducted in conjunction with the development of the Kodiak Island Borough Parks and Recreation Plan (1978). The purpose was to identify existing and future recreation needs of the borough.

TABLE 218

Frequency of Outdoor Recreation Participation

Activities	Total Number of Days of Participation
Driving for pleasure	4,454
Sport fishing	4,122
Picnicking	3,662
Hiking	2,456
Power boating	2,366
Subsistence food gathering	2,247
Running/jogging	1,999
Bicycling	1,741
Sport hunting	1,701
Nature study	1,551
Camping	1,438
Swimming	883
Snowmobiling	835
Cross-country skiing	557
All terrain vehicle driving	463
Trail bike riding	445
Horseback riding	411
Canoeing or kayaking	367
Downhill skiing	61

Cultural Dynamics 1988

Driving for pleasure, fishing, and picnicking were the outdoor recreation activities in which people most often participated. Generally Kodiak residents have some form of personal transportation which could be one reason why driving for pleasure is so popular.

KODIAK COMMUNITY COLLEGE SURVEY

During 1984, a telephone survey was conducted by members of the community college's newswriting class to determine what Kodiak residents thought about life there. Several questions were asked about recreation and the quality of life. Forty-three percent of the respondents were men, fifty-seven percent were women. The answers were scored on a scale from plus six, denoting the highest agreement or importance, to minus six, for the strongest disagreement or lack of importance. Scores between plus and minus one were neutral or indicated no opinion by the respondents. Table 219 displays mean scores for men and women respondents to some of the questions.

TABLE 219

Attitudes Towards Living in Kodiak City

Question	Mean Scores*	
	Men	Women
Borough park facilities adequate for my needs?	0.6*	1.6
The city provides adequate parks and recreation program?	1.7	1.9
Increasing tourism to Kodiak is a good idea?	1.5	1.9
Outdoor recreation opportunities are important to me?	4.8	4.1
Kodiak offers a sufficient number of cultural events	0.8	0.9
Overall, Kodiak is a good place to live?	4.6	4.6
* Range = +6 to -6		

SOURCE: KCC Survey

Cultural Dynamics 1986

These results confirm what is reflected in the other studies: outdoor recreation opportunities are important to Kodiak residents.

WILDLIFE REFUGE MANAGEMENT PLAN DATA

As part of the management activities in the different refuges, the U.S. Fish and Wildlife Service collects statistics on the hours of public use. Tables 220, 221 and 222 show this information for the Alaska Peninsula, Izembek, and Kodiak refuges.

CZMA VILLAGE DATA

The Kodiak Island Borough Coastal Zone Management Plan and Progress Reports include information about tourism and recreation in the villages. A brief description of recreation uses and associated areas of concern follows. The areas of concern are those cited by the State of Alaska Division of Parks (Recreation, Scenic and Heritage Areas of Particular Concern: Kodiak Archipelago 1980:1). The criteria for determining the concerns are:

- Areas that have region-wide unique resource values or have a significant combination of two or more resource values.
- Areas that, because of their proximity to population centers, transportation systems, or proposed developments are under consideration for special management.
- Areas that are publicly valued as demonstrated by use or identification by local residents.
- Areas that have been proposed for a special management designation in existing land use plans and programs.

Old Harbor. Hunting, clamming, and sport fishing are nonresident use activities near Old Harbor. Although there is scheduled flight service to Old Harbor, there are few tourists. Areas of concern near Old Harbor identified by the Alaska Division of Parks include Three Saints Bay, Barling Bay, Midway Bay, and Ocean Bay-Rolling Bay (KIB Coastal Management Program Progress Report Reprint 1983:58).

Port Lions. Of all the villages in the Kodiak/Shumagin area, Port Lions receives the largest number of tourists and nonresident visitors. A factor contributing to this is regularly scheduled state-operated ferry service. Hunting and fishing are the main activities of the tourists and nonresidents. Some conflict is felt by local residents who believe the visitors' activities interfere with the local subsistence lifestyle. In the Port Lions vicinity the areas of concern include Anton Larsen Bay, Barber Lake and Cove, and Kizhuyak (KIB Coastal Management Program Progress Report Reprint 1983:58).

TABLE 220

Public Use on Alaska Peninsula Refuge
(1982-83 Activity Hours)[1]

Activity	Total	Percent of Total
Hunting/caribou	12,406	16
Hunting/bear[2]	40	.1
Hunting/moose	1,500	2
Hunting/migratory birds	9,445	12
Hunting upland birds	1,710	2
Trapping	19,300	26
Fishing	7,478	10
Camping	9,728	13
Wildlife viewing	1,468	2
Foot/hiking	4,170	5
Boat	2,285	3
Off-road vehicle	6,800	9
TOTAL PUBLIC USE[3]	76,430	99.1

[1] One activity hour is equal to one person involved in the specified activity for one hours.

[2] The 1982 spring bear season equaled 32,000 activity hours and was not reflected within the time frame for this table.

[3] The local and nonlocal users are not differentiated in this table.

SOURCE: USF&WS

TABLE 221

Public Use on Izembek Refuge
1982-83 (Activity Hours)[1]

Activity	Total	Percent of Total
Camping[2]	800	3
Hunting/caribou	4,840	16
Hunting/brown bear[3]	520	1
Hunting/migratory birds	7,445	25
Hunting upland birds	1,135	4
Trapping	1,205	4
Fishing	2,565	9
Wildlife viewing/photography	610	2
Method of Travel		
Foot (hiking)	2,910	10
Boating	700	2
Land vehicle	6,600	22

Public inquiries	672	2
TOTAL PUBLIC USE[3]	30,102	100

[1] One activity hour is equal to one person involved in the specified activity for one hour.

[2,3] The refuge-wide bear hunt occurs in alternating years and did not occur in 1982-83. During this time period only the road hunt occurred. The amount of hunting activity hours for the period when hunting occurs produces a ripple effect that is reflected in other activities, such as camping.

SOURCE: USF&WS

TABLE 222

Public Use on Kodiak Refuge 1982-83 (Activity Hours)[1]

Activity	Total	Percent of Total
Interpretation	5,888	6
Waterfowl hunting	1,965	2
Upland game hunting	1,615	2
Deer hunting	36,728	35
Bear hunting	10,900	10
Small game hunting	1,360	1
Mountain goat hunting	936	1
Trapping	4,940	5
Fishing	27,455	26
Berry picking	4,350	4
Camping	900	1
Hiking	3,673	3
Boating	2,480	2
Photography	1,550	1
Other use	995	1
TOTAL PUBLIC USE	105,914	100

[1] One activity hour is equal to one person involved in the specified activity for one hour.

SOURCE: USF&WS 1985 Cultural Dynamics 1986

Akhiok. There is occasional bear hunting near Akhiok by nonlocal residents. Areas of concern to the State Parks are Tugidak Island, Drake Head, Russian Harbor, and South Olga Lakes (KIB Coastal Management Program Progress Report Reprint 1983:56).

Karluk. The area surrounding Karluk is famous for its excellent fishing. Consequently, conflict often arises between subsistence and recreation users. Near Karluk the areas of concern are Halibut Bay, Azakulik River, Karluk Lake, and Karluk River (KIB Coastal Management Program Progress Report Reprint 1983:57).

Larsen Bay. Larsen Bay is a jumping off point for hunters and fishermen flying out to more remote areas. Carlsen Point, Chief Point and Cove, Uyak Bay, and Little River Lake are areas of concern (KIB Coastal Management Program Progress Report 1983:57).

CAUTIONS

Several public and private sector management plans, surveys, and studies were used to prepare this description of tourist and recreation activities.

Readers should be aware that different methodologies were employed, that in some cases the number of respondents was small, and that other shortcomings may characterize the efforts.

A lack of consistent baseline data became clear as the user behavior information was compiled. Causes of this inconsistency include incompatible measures between agencies, shortfalls in research on recreation, and the unavailability of longitudinal studies. Both public and private sectors involved with outdoor recreation and tourism would benefit from the adoption of standarized user behavior data.

Implications for the Regional Economy

In this part, estimates are provided of the contributions that tourism and recreation make to the Kodiak/Shumagin economy. The extent of activities by users forms the basis for these estimates, and the implications of this user behavior are explored. The cautions just mentioned apply as well to the following analysis.

1983 SURVEY AND ANALYSIS

The Alaska Traveler Survey and Visitor Industry Analysis 1983 surveyed businesses in Alaska to determine the economic impact of nonresident Alaska visitors on Alaska's economy. The data are not disaggregated by regions; therefore, for purposes of this report, visitor expenditures for Kodiak were estimated by extrapolation. The expenditures are based on the ratio of nonresident Alaska visitors to Kodiak to the statewide totals from the survey.

Generally, the analysis and conclusions based on the statewide nonresident visitor expenditures within Alaska parallel the Kodiak nonresident visitor expenditures. Kodiak nonresident visitors did spend approximately 20 percent more per party while in Alaska according to the statewide analysis; much of this increase can be attributed to the extra transportation expense of getting to Kodiak and the longer than average stay in Alaska by visitors to Kodiak. The visitor expenditure data was extracted from the actual Kodiak visitor responses to the statewide survey and the Kodiak business data was extrapolated (except for the employment and wage figures) from statewide totals. (See Chapter IV). This was the only method available to derive information for this report.

Information from Firms

A survey was sent to 1,700 firms conducting business in Alaska. The businesses were taken from three sources: (1) Alaska Department of Labor files of all firms with employees who are subject to Alaska Unemployment Insurance, (2) Alaska Division of Tourism and Alaska Travel Directory, and (3) Alaska Department of Revenue Directory of Business Licensed Firms. A list of all believed to be directly impacted by visitor expenditures, primarily in the service, retail trade and transportation industries, was compiled. Industry sectors and associated businesses were used as the sample universe and were called the visitor-affected industries. A weighted percentage of sales attributed to nonresident and resident visitors was determined from survey results. In addition to the survey, for this report other data was obtained from the Alaska Department of Labor employer files, the Alaska Department of Revenue, and local taxing authorities. To extrapolate Kodiak/Shumagin data, percentage ratios were used.

Information from Travelers

In the traveler survey portion of the 1983 analysis, data was obtained from 11,000 travelers who left Alaska. The survey was conducted on a monthly basis from October 1982 through September 1983. Several factors should be considered when reviewing this data. The firm survey referred to calendar year 1982, whereas the traveler exit information was obtained during 1982-1983. As a result, expenditure information is not directly comparable to receipts reported by firms. For purposes of the Kodiak/Shumagin analysis, survey results were obtained from respondents who indicated they had spent one or more nights in Kodiak. Results from the estimations derived from the 1983 survey and other state data indicate that grocery stores, eating and drinking establishments were the most affected visitor-related industries in Kodiak city (see Table 223).

TABLE 223

1982 Percentage of Employment in Visitor-Effected Industries by Category for Kodiak City

Transportation	Percent
Air Transportation Cert. Carriers	9
Retail Trade	
Grocery stores	29
Gasoline service stations	4
Eating	26
Drinking	21
Drugs & proprietary stores	5
Services	
Hotels, Motels	4

SOURCE: Alaska Department of Labor, Report of Employment and Wages. Data excludes firms that are inactive or delinquent in filing unemployment insurance contribution reports.

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Sales to nonresident Alaska visitors accounted for $13.4 million or 22.9 percent of total estimated sales in visitor-effected industries in Kodiak during 1982. An additional 15.6 percent of sales of $6.1 million were attributed to resident Alaska visitors (see Table 224).

TABLE 224

Employment, Wages and Sales in Visitor-Effected Industries in Kodiak City

	Employment[1]	Wages[2]	Sales[3]
Visitor Industries	641	$ 9,731,709	$ 58,899,875
Nonresident visitors[4]	153	2,279,169	13,488,071
Resident visitors[5]	118	1,728,352	9,188,381
Local residents[6]	370	5,724,188	36,223,423

[1 & 2] Alaska Department of Labor, Report of Employment and Wages ES-202, 1982. Selected visitor-effected industries (does not include government employment).

[3] Ratio and extrapolation to statewide totals.

[4 - 6] Percentage of firm survey responses to the distribution of employment, wages, and sales for each visitor category.

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Based on these figures, it is estimated that expenditures by nonresident Alaskans contributed to over 150 jobs in Kodiak in 1982, and expenditures by resident visitors accounted for another 118 jobs. Most significant is the estimation that approximately 25 percent of the total employment, wages, and sales in the city can be attributed to nonresident visitors. Using the previously described methods of extrapolation, the amount of state and local revenue that can be attributed to nonresident Alaska visitors to Kodiak is estimated at $338,000. The amounts shown in Table 225 are very rough estimates, at best.

An estimate of the indirect benefits generated by the nonresident Alaska visitors can be gotten by applying a multiplier to the extrapolated visitor expenditure figures. The appropriate multiplier is estimated to fall between 1.5 and 1.8 (Alaska Traveler Survey and Visitor Industry Analysis 1983:I-54). The results of this rough approximation are shown in Table 226. In spite of the limitations on this estimate, the impact can be assumed to be of consequence for the local economy.

1983 Survey Summation

The economic implications of tourism for the region are clear from the Alaska Traveler Survey and Visitor Industry Analysis 1983. Results reported here were extrapolated from the statewide data (with the exception of some of the employment statistics), which places some limits on the estimates. Also, the methodology and limitations of the statewide study should be remembered. Even so, the overall economic effects are important; our data suggest that nonresident visitors contributed an estimated 25 percent of the total employment, wages, and sales within the city.

TABLE 225

Sources of State and Local Revenue From Visitor Activities in Kodiak, State Fiscal Year 1982

State Sources	Nonresident Visitor Revenue
Corporate income tax	$ 25,000
Sales/use tax[1]	132,000
Sport & Game Licenses	73,000
Subtotal	230,000
Room tax	53,000
Property tax	55,200
TOTAL[2]	$ 338,000

[1] Taxes on marine, highway, and aviation fuel, tobacco and alcoholic beverages.

[2] Revenue amounts estimated and extrapolated from percentage of nonresident Alaska visitors to Kodiak with statewide totals. Estimates derived from total government receipts data and estimates of proportion of total business associated with visitor expenditures (Alaska Traveler survey and Visitor Industry Analysis 1983: X1-X7).

TABLE 226

Estimated Benefits of Resident and Nonresident Visitor Expenditures to Kodiak City During 1982

	Sales	Wages
Direct Resident	$ 9,188,381*	$ 1,728,352*
Direct Nonresident	13,488,071	2,279,169
Multiplier 1.5	34,014,678	2,592,528
Multiplier 1.8	40,817,613	4,102,504

* Estimates from Chapter IV

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HUNTING AND FISHING

Two of the most popular recreation activities in the Kodiak/Shumagin area are hunting and fishing. To gain a sense of the economic implications of outdoor recreation, two sets of information are provided. First is an estimate of the number of individuals who engage in hunting and fishing, and second is a calculation of the results of recreational expenditures.

Estimated Numbers of Hunters and Fishermen

Tables 227 through 232 present the number of people assumed to engage in selected outdoor activities. The sources for the various data sets are cited with each table. Limitations do exist on the numbers because of different agency methods of gathering statistics and computing participation rates, and because of the lack of information in some categories.

For sports hunters, the number of bear hunters is the most accurate figure of any species because of Alaska Department of Fish and Game licensing and reporting requirements. The number of hunters for other species and for fishing were estimated from ADF&G reports, records of participation rates, interviews with personnel on Kodiak Island, and by extrapolation from these sources. The estimated number of hunters and fishermen are for the two Alaska Fish and Game Management Units (8 & 9). A limited amount of goat hunting takes place on Kodiak Island and has not been included in this report.

TABLE 227

Number Sport Fishing in Kodiak Area
1977-1983

Year	Kodiak Residents	Nonresidents	Mainland Residents
1977	4,587	3,306	4,200
1978	4,950	3,673	4,523
1978	5,317	4,061	4,835
1980	4,915	4,535	4,440
1981	5,491	5,039	4,896
1982	5,983	5,559	5,335
1983	6,354	6,221	5,666

Charter service: 10 percent of residents, 30 percent of nonresidents, 20 percent of mainland residents.

SOURCE: Number of Kodiak resident license holders from Fish and Game (Statewide Harvest Survey); nonresidents extrapolated from number of nonresident license holders (Statewide Harvest Survey) and percentage of nonresidents that indicated fishing participation within Alaska; mainland residents estimated from transportation and participation rates.

TABLE 228

Unit 8 Number of Bear Hunters
1977-1983

Year	Residents	Nonresidents
1977	221	95
1978	258	109
1979	289	118
1980	260	96
1981	317	119
1982	341	101
1983	392	108

Guide service: 30 percent of the residents estimated to use a guide and all nonresidents are required to have a guide; estimated 50 percent of residents use charter services.

SOURCE: Number of hunters from Fish and Game area biologist reports, guide and charter estimates from interviews with guide services and Fish and Game personnel.

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TABLE 229

Unit 8 Number of Deer Hunters
1977-1983

Year	Kodiak Residents	Nonresidents	Mainland Residents
1977	440	77	445
1978	188	7	183
1979	919	161	846
1980	989	115	840
1981	1,001	141	810
1982	1,029	131	815
1983	1,123	147	822

Commercial charters to hunting area: 15 percent Kodiak residents, 80 percent nonresidents, 70 percent mainland residents.

SOURCE: Number of hunters from Fish and Game area biologist reports and extrapolation; estimated charter percents from interviews with guides and Fish and Game area biologist.

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TABLE 230

Unit 9 Number of Caribou Hunters
1977-983

Year	Residents	Nonresidents
1977	894	192
1978	550	170
1979	576	229
1980	761	213
1981	559	268
1982	478	160
1983	514	190

Guide service: 35 percent of the nonresidents guided.

SOURCE: Number of hunters and guide service estimates from Fish and Game area biologist.

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TABLE 231

Unit 9 Number of Bear Hunters
1977-983

Year	Residents	Nonresidents
1977	120	160
1978	118	155
1979	82	158
1980	110	185
1981	116	168
1982	100	201
1983	118	175

Guide service: 30 percent of residents estimated to use guide service; nonresidents required to use a guide service.

SOURCE: Number of hunters from Fish and Game area biologist.

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TABLE 232

Unit 9 Number of Moose Hunters
1977-1983

Year	Residents	Nonresidents
1977	N/A	N/A
1978	352	121
1979	N/A	N/A
1980	320	138
1981	292	103
1982	195	66
1983	358	89

* N/A - not available

Guide service: 50 percent of nonresidents guided; 10 percent of residents guided.

SOURCE: Estimates from Fish and Game area biologist and U.S. Fish and Wildlife Management Plans; guide service estimates from the Fish and Game area biologist.

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Estimated Economic Consequences

In an effort to describe the effects of these numbers of people on the economy, Table 233 was prepared. Dollar amounts for various services were estimated from information provided by Fish and Game personnel, guide services, and the Alaska Professional Hunters Association. Guide services on the Alaska Peninsula are provided in almost all cases by people not residing on the Peninsula; many come from Anchorage. Consequently, much of the dollar amount attributed to the Peninsula does not stay in the area.

For Kodiak, 60 percent of the guide services are estimated to be provided by Kodiak residents and 80 percent of the charter services are estimated to be provided by Kodiak residents. Many small independent operators provide charter services and the number of these is not known.

These estimates suggest that the overall expenditures by residents and nonresidents for outdoor recreation activities approaches $4.6 million. An estimated $1.5 million potentially enters the Kodiak economy directly. There is clearly an economic impact from hunting and fishing.

Summary

Outdoor recreation is clearly a significant aspect of everyday life in the Kodiak/Shumagin region. Tourism is a growing part of the local economy. Much of the land in the region is under federal jurisdiction and managed by federal agencies under plans mandated by law. Wildlife resources are the responsibility of the Alaska Department of Fish and Game. A smaller management role is played by the Alaska State Parks.

TABLE 233

Hunter/Fisherman Expenditures
1983

Alaska Peninsula	
Guided resident hunters @ $2,000 per hunt	$ 142,000
Guided nonresident hunters @ $8,000 per hunt	2,296,000
Guided fishermen @ $300 per day	82,500
Kodiak	
Guided resident hunters @ $3,000 per hunt	354,000
Guided nonresident hunters @ $3,800 per	410,400
Charter services @ $300 per trip	1,397,100
TOTAL	$ 4,682,000

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Many of the conflicts perceived by residents, such as access, protection of fish and wildlife, habitat issues, and the like, depend on agency management policies. In most cases in 1985 plans for the federal lands were still being prepared, so their final policies were not yet set. The final agency plans and the subsequent policies and regulations will influence the most popular outdoor recreation activities: sport fishing, sightseeing, hunting, and tourism. Outdoor recreation activities are "quality of life" issues and the review of the available data suggests local residents place a high value on them. Keeping the opportunities available is important to the people who live in the Kodiak/Shumagin region. Another important aspect is the economic benefit derived from outdoor recreation and tourism. An estimated 25 percent of the sales, wages, and employment within the town of Kodiak are generated from nonresident tourism and outdoor recreation.

The data reviewed in this chapter are subject to limitations; adequate baseline data are lacking. Methodologies vary and may be inconsistent. There is a notable lack of longitudinal studies. Even so, sufficient reliable information was available to ascertain that outdoor recreation and tourism provide significant positive quality of life and economic benefits with the Kodiak/Shumagin study area.

VII. INFRASTRUCTURE INVESTMENT IN THE KODIAK CITY AREA

by P. J. Hill, Ph.D.

Introduction

In this chapter we document and analyze the changes that have taken place in the productive infrastructure of the Kodiak city area economy. Providing a description and an inventory of the economic infrastructure helps to quantify and qualify the investment process. It also allows us to ascertain how the infrastructure and its institutional base might respond to increased demands brought about by OCS development. The investment process adds productive capacity to the economy and changes the way the economy responds to increased exogenous demands.

Private and public infrastructure expenditures influence the economy in several ways. First, the construction of facilities has direct, indirect, and induced effects. The direct effects include the purchase of commodities, services, and labor to construct or design projects. The indirect effects result from the demand for commodities, services, and labor needed to produce inputs required to construct the projects. And the induced effects come when individuals spend in the local economy the wages, salaries, and other income gained from the direct and indirect effects of the projects.

In addition to the above, other consequences may be present before, during, and after the construction of a project. First there is anticipation, which may cause the business support sector to invest in facilities prior to the project. Accelerator effects may also occur if private sector investment activity puts strains on the existing infrastructure (new stores or new housing). Additional demands for goods provided by the public sector can be fostered by added private and public projects (a new auditorium or hotel will increase the demand for water, sewer, police, and fire protection services).

The operation and maintenance effect of new facilities is a long-term consequence. This is an especially important impact of many public projects. Once the infrastructure is complete there is either an explicit or implicit commitment of future revenues to support the facility. With most state grants to municipalities, the local government must agree to support a facility's maintenance and operation. This has somewhat different implications when the project generates a revenue stream, such as a sewer system, water system, or port facility, in contrast to a public building that must be supported by general revenues.

Finally, there are structural changes. The existence of a new facility may produce an increase or decrease in economic activity because it changes the structure of the economy. New infrastructure provides a direct flow of services to the local and regional economy. It may alter the local economy by lowering transportation and utility costs. It may change the price or availability of inputs to production. For example, a hydroelectric project that provides a stable source of supply of electricity might be able to attract industry that would otherwise locate elsewhere. Structural change can also result from a change in the market size--a growth in the market leads to more and new types of firms entering the market, along with potential increased product availability and more price competition.

Private business investment comes about because of future anticipated productivity in the local and regional economies. In Kodiak the local and regional economies are driven primarily by the seafood industry, and thus private investment is tied to the vagaries of that industry. However, over the past few years, the government has become an increasingly strong force in the economy. This is amplified by the large public construction projects that have been undertaken at a time when the local fishing and lumber economies have been in a relatively depressed state (see discussion in Chapter IV).

Public investment takes place at the federal, state, and local levels. Aside from the U.S. Coast Guard, little data on federal expenditures is available (except for an occasional building permit). By and large, all local government projects are constructed in conjunction with funding from the State of Alaska (local schools are almost wholly financed by the state). Then there are the direct expenditures that the state makes through its respective departments (highways or the University of Alaska, for example). See Chapter V.

Investment expenditures can be divided into several distinct categories. The most useful way for this study is on the basis of the public and private sectors. The private sector can be further divided on the basis of residential and nonresidential investment expenditures. An additional division of nonresidential investment which would be beneficial, but unfortunately is not possible, would be to separate this category on the basis of structures and producers of durable equipment. This would be especially helpful because fishing boats could be broken out under this category.

Public Investment

There are several public sector projects that have altered the structure of the Kodiak economy. These include the Terror Lake power project, the Near Island bridge and Dog Bay boat harbor, and the sewer and water system expansion; they are described in some detail in the following sections.

TERROR LAKE

The Terror Lake Project was conceived in the late 1970's as part of a scheme to convert Alaska's nonrenewable energy (petroleum) resources into a renewable energy (hydroelectric) resource. Along with three other projects (Swan Lake near Ketchikan, Solomon Gulch in the Valdez-Glenallen area, and Tyee Lake near Petersburg and Wrangell), Terror Lake was funded in 1982 as part of the "Four Dam Pool."

Total cost of the four projects was $462 million, of which $284 million was a direct grant. The financing of $178 million is to be amortized over 50 years and is to be repaid to the State of Alaska at an interest rate of 5 percent. The agreement that the Four Dam Pool Committee negotiated with the State essentially leaves power rates in the respective communities at the same level as existed prior to the construction of the projects (Kodiak residents now pay 17.5 cents per kilowatt-hour). The proposed sales agreement was scheduled for conclusion sometime in October 1985, as this report was being prepared.

The Kodiak project started June of 1982 and was completed in October of 1984. Construction was divided into two parts: the dam, powerhouse, and tunnel ($128,600,000) was constructed by Kiewit-Groves; and the transmission line into Kodiak ($10,971,000) was constructed by Fischbach and Moore. At its peak, employment on the project reached approximately 500 persons. Initially, Kiewit-Groves hired 28 foremen from outside Alaska, primarily supervisory personnel who had worked for the company on other jobs. There was a great deal of sentiment in Kodiak favoring local hire; the Kodiak Electric Association and the Chamber of Commerce passed resolutions asking the contractors to use local labor. However, for the most part few residents were hired. In the first place, the contractor used union labor that was primarily dispatched out of Anchorage; Kodiak laborers did not always have priority. Second, the experience the contractor did have with local labor was not positive. Many Kodiak hires were not dependable and were relatively undisciplined when compared to their counterparts. Third, the skills necessary for a great proportion of the jobs on the project simply were not available in the Kodiak market. As a result, local labor, according to the project manager for the Alaska Power Authority, never exceeded 20 percent of the labor force.

Toward the end of the project (September 1984) Harza-Ebasco, a consulting firm on contract to the Alaska Power Authority, did a survey among employees on the Terror Lake project. Among other things, the survey asked about economic ties, living locations, and future plans. Of the 200 chosen for the survey, only about 68 responded. Seven (10.4%) of the respondents listed Kodiak as their residence prior to working on the Terror Lake project. Of 67 responses, 18 (26.4%) indicated they expected to remain in Kodiak. These individuals may or may not have stayed permanently after Terror Lake, but in all probability if they did it would have been to work on the Near Island bridge, which was also constructed by Kiewit. In all likelihood the 20 percent of local hires reported by APA is a fairly accurate figure.

One effect of the Terror Lake project was a temporary increase in families residing in Kodiak. Kiewit-Groves established 20 families in mobile homes in Kodiak city, in addition to housing they provided at the project site. The primary impact in the town of Kodiak was in the service sector. Some workers commuted from town. Workers who did not live in Kodiak were paid travel time, and thus commuted to the project from Anchorage or elsewhere in Alaska. This was the period when Alaska Airlines began service into the Kodiak area. Air Transportation Services chartered a Grumman Goose and Cessna 206 daily to the project. Additionally, other air taxi operations received a considerable amount of business as a result of the project. Motels and hotels in the area were used heavily as bunkhouses.

DOG BAY BOAT HARBOR

The small boat harbor, when it was reconstructed after the 1964 tsunami, had moorage for approximately 210 boats. Over the years, with an increased economic base from the growth in fishing and marine transportation, a severe strain was placed on the existing facilities. In 1971 the Army Corps of Engineers conducted a study to establish an additional small boat harbor in Kodiak. Dog Bay, located on Near Island (separated from Kodiak city by a 300 foot channel) was chosen. Construction was begun in 1981 and completed in 1982. The $8,300,000 project was funded by the state and constructed by Western Marine Construction of Bellingham, Washington. An additional 280 new boat stalls were built. The project involved the installation of steel piles, slips, and docks in Dog Bay and the excavation of an additional entrance to the harbor. The moorage was to be protected from southerly weather by the installation of a floating breakwater.

Virtually the entire project was constructed using labor that can be described as "non-local" in nature. Because the construction of the marine facilities required highly specialized labor, all the workers were permanent employees of the contractor. In addition, all of the materials and structures were prefabricated elsewhere and moved onto location. Thus the major economic effect of the project, aside from the enlarged facilities, was in the service sector--providing temporary living accommodations, transportation, etc. The Dog Bay Harbor was modified in 1985 by upgrading the piles to 1/2" thick walls. This upgrading cost $1 million. The local economic consequences were similar to those of the initial construction.

A continuing problem is deterioration from the southerly weather accosting the facility. A permanent breakwater at Gull Island (estimated to cost from $12 million to $20 million, depending on the source of material) has been proposed. It would be coupled with an additional breakwater to protect the deep draft dock (city dock) and is expected to cost $25 million (depending on the source of the breakwater material). However, both projects are only in preliminary planning stages; their construction would require significant amounts of state funding.

Near Island Bridge

The new small boat harbor in Dog Bay was being served by a shuttle boat making round trips back and forth every half hour. However, construction of a bridge between Kodiak city and Near Island was part of the overall long term plan. In the sequence of events, the construction of the bridge followed the building of the new small boat harbor.

In 1983 money was appropriated by the State of Alaska for the Near Island bridge. The total cost of $15,200,000 was actually funded in two parts. Piers 5, 4, 3 & 2 were constructed beginning in May 1983 under the first contract to Jensen and Reynolds. The final pier, #1 on Near Island, as well as the roads and the superstructure, were started in April 1985; this contract was with Kiewit-Groves. The bridge was expected to be completed by October/November 1985. Employment generated by construction of the bridge was relatively small. Over the first year the workforce averaged 8, of which never more than half were residents of Kodiak. From August 1984 to December 1984, of eight employed on the bridge only two were local residents. Kiewit started their operation in April of 1985 and as of June 1985 thirty-three people were employed on this phase, of which only four were local hires.

The Near Island bridge will make accessible 275 additional acres of land that is near the center of the town. All of this land is owned by the City of Kodiak, which has yet to decide how and when development will take place. Utilities will be available on the island through a utility corridor on the new bridge; thus the island will have a full complement of utilities. The Port of Kodiak Development Plan, published in 1982, was--at the time of this study--not yet completely endorsed or ratified. Its adoption would set aside on Near Island 94 acres for residential development, 14 acres for commercial, 4 acres for marine industrial, and 7 acres for gear storage. Additional facilities, like the University of Alaska Fisheries Technology Center and Land Reserve, would take up the remaining areas. This would be a significant change for Kodiak, where the supply of developable land has always been rather restricted.

An additional impact that the bridge will have is on air taxi operations. Many of the taxis and other float planes use Lily Lake as a base. But Lily lake is too small to take off safely with planes that are fully loaded. Because of this, float planes have used the harbor and channel as a primary area for routine operations. Now, the presence of the bridge will eliminate the use of the channel for these float plane operations. Thus, air taxis will, in all probability, be forced to switch their operations to the state airport; in the process they will have to convert to the more expensive amphibious floats. Flyrite has already started to build a hanger at the state airport, and it is expected others will follow. The cost of air charters and taxi operators should be expected to increase.

SEWER AND WATER SYSTEM EXPANSION

One last illustration of change in the public infrastructure is the expansion of the sewer and water system. Since 1982 approximately $10 million has been expended to put sewer and water into areas heretofore not served. Before this expansion the water and sewer systems were confined primarily to within the city limits. Services have now been extended into a number of areas outside the city limits: the front and backside of Island Lake and Dark Lake, Spruce Cape, Miller Point and Mission Point areas. Four expansion projects have been completed and two more were under construction as of June 1985. Three other areas were under consideration for the expansion of service, depending on funding. In addition, sewer and water will be extended to Near Island. In total, this expansion extends the sewer and water coverage by 20 percent and could, if all the projects are completed, increase the service area by as much as 35 percent.

Kodiak derives its water from two sources, Pillar Creek and Monashka Creek. The water system is operated by the City of Kodiak, though water service is supplied to a considerably larger area: Mill Bay, Island and Dark Lake, Spruce Cape, and Gibson Cove. The total storage capacity of the system is 550 million gallons, since the expansion of the reservoir on Mohashka Creek and the installation of a new 24 inch line. Water demand is fairly cyclical; it is used most heavily when canneries are operating. At the present time there is enough capacity to meet increased demands from the water dependent industry and from further residential development and expansion. Heavily dependent on the water system is the Kodiak Fire Department. The town is served by three fire stations. The main one in downtown Kodiak is manned by full-time fire fighters. Two satellite stations, one in Monashka Bay and the other in Bell's Flats, are manned by volunteers. Established in 1982, each of the satellite stations has a standard firefighting truck and a pumper.

The City also operates the sewer system. A secondary sewage treatment plant that is capable of treating 2.2 million gallons per day is located on Spruce Cape. It has the capacity to service a population of 9,500, so is operating well below its capacity. However, during rains significant amounts of water infiltrate the system and push it over capacity. This infiltration is a fundamental problem. In June of 1985 the City of Kodiak received a waiver from the U.S. Environmental Protection Agency for the secondary treatment of sewage, so only primary treatment is necessary. It is not known specifically how this will affect Kodiak, but generally it should eliminate any extensive costs to upgrade the waste treatment system in the immediate future.

Another structural component of the sewage and waste treatment system is the Bio-Dry plant that processes crab and fish waste solids into fish meal. Bio-Dry was established in 1974, with the blessing of the EPA, to recover protein by-products. When the price of the protein by-product failed to recover costs, the processors subsidized Bio-Dry. A higher price of protein meant a lower charge to the processors. There was a continuing problem with air pollution at the Bio-Dry plant itself. In late 1984 the facility was closed to undergo extensive renovation, possibly to reopen in late 1985 or early 1986. While Bio-Dry is closed, the processors are required to dispose of their screened wastes at sea, at specified distances from Kodiak city.

U.S. COAST GUARD

An important component of construction activity is carried out by the U.S. Coast Guard. The expansion of the infrastructure at the Coast Guard base in Kodiak has been substantial over the past 15 years, and these activities will continue to be significant as the Coast Guard's role in enforcement of the 200 mile limit increases.

Over the decade of the '70s, construction activity averaged $4.2 million per year. This data was derived from the contract register of the regional U.S. Coast Guard headquarters. The Coast Guard is bound by U.S. government contracting procedures that require any contract over $125,000 to go on a national register. In the 1970s, 62 percent of the local contracts were awarded to firms based outside Alaska, and another 23 percent were awarded to firms located outside Kodiak. Only 14 percent of the contracts (9.2 percent of the dollar amount) were awarded to local Kodiak firms (see Table 234).

TABLE 234

Summary of U.S. Coast Guard Capital Construction Contracts 1973-81 (calendar years, in thousands)

	Kodiak Firms		Alaska Firms		Outside Firms		Total	
Year	#	$	#	$	#	$	#	$
1973	3	29	5	239	13	1,767	21	2,035
1974	3	54	6	298	23	5,675	32	6,027
1975	1	233	5	1,157	12	2,076	18	3,466
1976	5	732	8	648	20	1,484	33	2,864
1977	4	243	5	729	18	9,038	27	10,010
1978	2	145	4	2,102	9	3,692	15	5,939
1979	2	576	10	411	29	1,416	41	2,403
1980	9	822	8	1,358	20	3,606	37	5,786
1981	7	995	7	1,419	13	825	27	3,239
Totals	36	3,829	58	8,361	157	29,579	251	41,769
Percent	14.3	9.2	23.1	20.0	62.6	70.8	100.0	100.0

SOURCE: U.S. Coast Guard, Juneau, Alaska, Contract Register.

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Not all of this money completely escaped the Kodiak economy, as there was surely some local hire by the outside firms. Also, even transient labor and supervisory personnel spent funds locally for food and lodging. But this is countered by the fact that local firms hired labor from outside. It appears the amount of construction money affecting the local economy as a result of U.S. Coast Guard infrastructure expansion is probably small, relative to the total Coast Guard program. Though Kodiak firms' shares have been small in the past, the impact of construction on the base may grow. The amount to be spent is projected to increase markedly over the next few years. In FY84 Congress funded $22.2 million for the Kodiak base, and priorities for FY85, 86 and 87 are $10.0 million, $6.4 million, and $25.3 million, respectively.

Unfortunately, data on capital construction at the base in Kodiak for the period 1982-1984 is not readily available. Twenty-two million dollars of capital construction was indicated in 1984, but we must assume that the construction would not have taken place until 1985. For purposes here it is assumed that contracts in the 1982-1984 period have been at the level that was funded on average over the previous 10 years. Also, it is assumed that the geographical location of the bidders is similar to the previous experience--Kodiak concerns receiving 10 percent of the value of the contracts, Alaskan (non-Kodiak firms) accounting for 20 percent of the value, and "outside" firms for the remaining 70 percent of the contracts.

Private Investment

In addition to public investment, there have been a number of additions and changes in the private sector that have altered the overall economic structure. In many ways the economy of Kodiak prior to 1975 could be considered to be composed of a number of small monopolies. Since that time competition has emerged in several different markets which has, in all probability, affected prices and product availability, though empirically these adjustments are difficult to support.

Prior to 1975 there was one major food supplier in Kodiak--O. Kraft and Sons. In 1975 Krafts built another large store on Mill Bay Road, away from the downtown area. Intended primarily to serve households, this new store (called Waldo's) was unlike the downtown store; sales were on a cash basis, no credit accounts were kept.

In 1977 City Market, which had been a small convenience market for some time, expanded their operation and entered into full competition with Krafts. Mark-it Foods entered the market in 1978. Both of these entrants serve boat accounts and others on a credit basis (an almost unheard of practice in the retail food industry). Thus, in a matter of three years the number of sellers tripled.

Although difficult to measure, the general impact has been to increase product availability (Waldo's has a fresh bakery) and lower prices. In 1983 Krafts established a convenience store (as opposed to a full-line food store) in Bell's Flats, and Mark-it Foods opened a convenience store in the Monashka Bay area. When Waldo's Shopping Center was established, one of the other stores that was added was the Mill Bay Pharmacy. This meant the number of Pharmacy/Drug stores doubled. Again, economic theory suggests that a result would be to lower prices and increase customer service and satisfaction.

The number of rooms in motels/hotels increased by almost 50 percent in 1983 and 1984. In 1983 the Bushkin River Inn (40 rooms) was built near the state airport. The Sheffield House, which had 46 rooms, expanded to 60 in 1984. The Star Motel (30 rooms), and the Shelikof Lodge (39 rooms) are the remaining competitors.

Another example of increased competition was the introduction of an additional seaborne freight carrier. Brechan Construction, the operator of the only concrete batch plant, started shipping cement from Seattle, where previously their bulk cement had come from Anchorage. Other firms have switched shippers (e.g., Sutcliff's, the major hardware store), though they did not change the source of supply.

There have been other entries in a variety of different markets. Kodiak has not escaped the fast food revolution, with national chains opening outlets. Dairy Queen began in the late '70s and McDonalds opened in 1984. Another fast food national chain outlet opened in 1982 called the "Golden Skillet." Both the Dairy Queen and the Golden Skillet were under one ownership. In 1983 the Golden Skillet went out of business, and in June 1985, the Dairy Queen closed its doors. Speculation as to why these restaurants failed includes both poor market forecasting and an over-capitalization of financial resources of the owner. There is also some indication of low market demand for the food specialties of the two restaurants and increased competition with other fast food operations.

There have been a number of small boutiques, book stores, and variety shops. In part, this is a result of population growth such that the overall market has reached sufficient size to support a larger variety of firms. The degree of specialization is a function of market size. But the impact is clear--a larger variety of goods are now available to consumers in Kodiak. In the long run, this will probably alter the practice of flying to Anchorage and Seattle for purposes of shopping. The other impact, though difficult to measure over a short time period, is increased price competition.

SEAFOOD INDUSTRY

Data on investment in the seafood industry is very limited. For this report two areas could be separated: boats and fishing gear, and plants and processing capacity. Data on the purchase of boats and gear that have entered the different fisheries in and around Kodiak is not available. Although not generating many employment effects in the local economy (except for a few firms that service boats and their gear), these purchases must have a substantial impact. Virtually all of them result in leakages to the outside economy. It is too bad the data are not available to judge the magnitude of these effects. Aside from the firms that service the fishing industry, the primary consequence of additional gear and boats has been to increase the demand for city moorage and services associated with the boat harbor. With the addition of Dog Bay, small boat moorage increased from 210 stalls to 490, and Dog Bay, was designed to be able to expand moorage even more.

The investment in plant and equipment in the processing side of the fishing industry, on the the other hand, generates significant employment and multiplier impacts in the local economy, as well as future increased demand for utilities and public services. But here again specific data is not available.

An alternative way of examining this aspect of the local economy is to examine qualitatively the changes that have taken place in the seafood processing sector over the past 15 years. Prior to 1950 processing facilities in Kodiak were primarily devoted to salmon fishing. Herring and halibut were handled, but salmon was the primary product. The king crab fishery emerged in the 1950s and peaked in 1966. At that time there were 32 processors. Low harvests in king crab and salmon in the late '60s and early '70s reduced the number of plants operating in Kodiak to 12, with 4 in the outlying areas (Port Bailey, Uganik, Larsen Bay, and Alitak). During this time some processors relocated from Kodiak to Dutch Harbor and Unalaska to be closer to the source of supply. (In the initial stages, crab from the Bering Sea and Aleutians were processed in Kodiak).

In the mid-1970s a new phase of expansion in Kodiak processing took place, when the king crab stocks and salmon rebounded. Ideal biological conditions continued for several years up to the early 1980s. Then the king crab population crashed, with a concomitant economic impact on the local economy; there was no king crab season in Kodiak in 1984 and none is expected over the next few years. Likewise, 1983 saw a return to a fairly meager harvest of salmon. 1984 was considerably better than the 1983 season, but the 1985 harvest was predicted to be lower than 1983 harvest. The halibut fishing rebounded in 1984 and 1985 from its relatively moribund state over the past decade. The shrimp fishery declined significantly in the mid '70s.

Not only have there been substantial declines in the physical stocks over the past several years, but the relative market strength of U.S. imports has dropped as well. The U.S. dollar has been at an all-time high in terms of other currencies, thus depressing seafood prices, which has concomitant impacts on the fishing and processing sectors. The total ex-vessel value of Kodiak regional fisheries has dropped significantly. In 1976 the value was $55.5 million. This increased to $106.2 million in 1981 and had fallen to $50.4 million in 1983.

The recent history of plant expansion shows significant changes in capacity. In 1967 there were 11 processors in Kodiak. In 1968 the Western Alaska plant (B & B) was built. In 1972 King Crab doubled its floorspace. In 1974 Alaska Pacific Seafood (APS) increased their plant size by 40 percent. In 1975 East Point built a separate facility. In 1976 Pacific Pearl built a large new processing facility, and in 1977 Swiftsure bought and expanded one of the existing (formerly Martins) facilities. Also, in that year Whitney-Fidalgo doubled their processing capacity. In 1979 King Crab increased their freezing capabilities, and in 1979-80 the International Seafood plant was built, marking the last major plant to be constructed.

Since 1980 the major improvements have been additional freezing blast tunnels and ice houses. Port Bailey (CWF) added freezer facilities and blast tunnels in 1983, and in 1984 Alaska Fresh rebuilt its facility with an eye towards developing and specializing in fresh and frozen bottomfish. Since 1980, though, the additions to plants have been primarily qualitative in nature; no major additions have been undertaken. Many of the changes since 1980 have been undertaken to convert capacity, at least partially, to groundfish processing.

Future investment plans in the private sector are speculative. In large part they depend on what happens in the groundfish (bottomfish) fishery. In late 1984 Alaska Pacific Seafoods was awarded a $1.5 million contract by the Alaska Fisheries Development Foundation to demonstrate the feasibility of producing surimi. However, this does not necessarily mean that Kodiak will be the focus of the pollock processing industry. In June of 1985 a Japanese firm announced its intention to build a $10 million surimi plant in Dutch Harbor, so it would appear such an investment in the Kodiak area is not a foregone conclusion. There are good arguments for placing a facility close to the source of the resource. At the same time, Kodiak is a desirable location from a processing standpoint in view of the newly available land on Near Island, and the availability of relatively cheap, consistent electrical power.

Summary

For property tax purposes, there are currently 24 canneries listed in Kodiak. However, as of 1985 only 11 or 12 were viewed as being operating concerns. The conversion to bottomfisheries business has not met with much success, and a number of operations have shut down with no plans of reopening. The immediate term does not appear bright. Most observers do not expect the price of the dollar to return to its level of the '70s in the foreseeable future. Thus American fish products will have a difficult time competing in the international marketplace. To this must be coupled the loss of the king crab fishery which is not expected to rebound before 1988 at the earliest. If Kodiak processors are able to successfully convert over to a low price high volume product (the opposite of what they've processed historically), then there may be some hope. But at present all of this is speculative, and the fact remains that there are significant amounts of excess capacity in the processing sector.

WOOD PRODUCTS INDUSTRY

The forest products industry is a potentially significant sector. Important commercial timber stands are located on the north end of the archipelago. There are approximately 400,000 acres of forested land, though not all is commercially viable. It is estimated that there are approximately 1 billion board feet; however, the quality is relatively poor when compared to the timber of southeast Alaska.

As a result of the Alaska Native Claims Settlement Act, Koniag, Inc. and Afognak Village Corporation gained title to the major portion of the commercial timber in 1977. State law requires that timber harvested on public land be marketed as primary processed cants (logs sawn on 3 sides); after the transfer to private ownership, round logs could be exported. The timber lands are being managed for Koniag by KONCOR, with Afognak Loggers as the company actually doing the harvesting. The logging operations are carried out from a camp at Danger Bay on Afognak Island. Besides the modern logging camp, almost 30 miles of logging roads now exist. Logs can be loaded on barges and moved out to deep water onto freighters. The maximum employment in the logging operation was 120, with an average of near 80. Of that only about 15 percent were Kodiak residents, with about 40 percent from other places in Alaska. The longshore operation employed 18 persons, but operated on only a half-time basis.

Harvesting ceased in October/November of 1983 as a result of depressed chip and timber markets. As with fish, a major factor has been the price of the U.S. dollar in foreign currency markets; U.S. exports find it difficult to compete in international markets. Part and parcel of the price of the U.S. dollar is high interest rates, which have traditionally had a negative impact on timber products industry. It is a matter of speculation as to when basic conditions facing this industry will change and when the operations in Kodiak will start up again.

TRANSPORTATION

The transportation of goods and services into and out of Kodiak involves three of the four basic modes: air, truck, and water transport. For the most part, except for a small portion of goods that have a low value/weight ratio, most of the commerce and transport takes place by sea. Truck transport, in practicality, is tied to the ferry system and involves only a very small portion of commerce. A few retail delivery trucks and an occasional shipment of asphalt for road construction is about all that is shipped on the ferry.

Water Transport

The sea transport system is composed of four common carriers and occasional private contracted shipping for large projects (for which no data is available). The canneries also contribute to the sea transportation infrastructure. Most of them are financially and logistically tied to Seattle, and as such are serviced from there by their own boats and tenders. In addition, these cannery boats transport goods for fishermen as part of their reciprocal economic relationship. Fishermen shipping up gear and goods can and do use cannery boats in lieu of common carriers, and although the volume of this is not known, it should not be overlooked.

Kodiak, by virtue of its location and the economic activity of the surrounding area, is an important consolidation and transshipment point. In fact, it is Alaska's largest southbound freight port for containers (Valdez ships more cargo southbound than any other port, but this this is all bulk tanker traffic). Aside from the cargo that moves north and south from Kodiak proper, the port is used to tranship cargo to and from the smaller communities in southcentral Alaska and the Aleutian Peninsula.

SeaLand Service Company is the major freight supplier, having provided regular service since 1964. The city provides dock facilities to SeaLand under a preferential use agreement that extends to 1992. In addition to the freight into and out of the town, SeaLand is the major transshipper.

The Aleutian Developer moves freight and containers (up to 90 containers) from Kodiak to and from King Cove, Sand Point, Dutch Harbor, Cordova, and around the island of Kodiak. Delivery to outlying communities and canneries is a significant part of the total volume of freight.

SeaLand's operation in Kodiak complements its other Alaskan operations. Anchorage is primarily a northbound port (significantly more goods move north than south), whereas Kodiak is a southbound port. This flow of commerce means that empty containers do not need to be deadheaded north from Seattle to Kodiak (for southbound freight) or south from Anchorage to Seattle (for northbound freight). Instead, containers are moved full from Seattle to Anchorage, where they are emptied, then taken to Kodiak, where they are loaded for the return south to Seattle. SeaLand has three sailings per week north to Anchorage, and once a week goes into Kodiak. The movement of freight is Seattle-Anchorage-Kodiak-Seattle, so if goods are being sent from Kodiak to Anchorage they have to move through Seattle. As is shown in Table 235, SeaLand's freight volume has not changed significantly over the past decade.

American President Lines entered the Kodiak market in 1979, on an international outbound basis. The Maritime Shipping Act of 1936 (the Jones Act) prohibits APL from shipping between U.S. ports, so the line's activity at Kodiak involves only the export of seafood to Japan. If the Jones Act were to be repealed or circumvented, APL would like to commence service between Kodiak, Anchorage, and Seattle, but it is doubtful that this will happen in the near future.

One of the major structural constraints to seaborne trade in and out of Kodiak is the lack of adequate storage facilities for containers and equipment at the Port of Kodiak. Goods are usually moved directly to and from the consignees, as there is a lack of storage near the dock, and that which is available is utilized primarily by SeaLand under its preferential use agreement. Additional storage is located is near the Pillar Mountain slide area, but APL stores containers 5 miles from the port near the state airport. Turnaround time once a ship is in port is approximately 24 hours, so the bottleneck clearly is the storage at the port, not the dearth of loading facilities.

Kodiak is also served by two tug and barge operations. In 1982-83, Sampson Tug and Barge started working, soon to be followed in 1983-84 by Foss Alaska, another seagoing barge operation. Both of these carriers used the Port of Kodiak facilities until mid-1984, but have since moved to a private dock in Woman's Bay near the U.S. Coast Guard base. The primary reason for the move was the inadequate storage space at the port and the preferential contract to SeaLand. Foss maintains a relationship with the longshoremen's union, though Sampson uses a non-union crew for stevedoring operations. Lash dock, owned by the maritime division of Brehan Enterprises (a local Kodiak construction company), is used by various private carriers as a substitute for the Port of Kodiak.

Foss's barge operation is on a two-week schedule, arriving every other week on Friday. The itinerary is Seattle-Ketchikan (pickup for interport deliveries in southeast Alaska)-Homer-Kodiak-Valdez-Cordova-Yakutat-Ketchikan.

TABLE 235
A: Northbound

Annual Cargo--Port of Kodiak (SeaLand)
(All figures in tons and data runs from October thru September)

Year	Northbound				
	TL	LTL	Transship	Military	Total
1974/75	26,498.8	9,860.0	37,049.6	--	73,408.4
1975/76	40,740.6	1,021.4	46,088.1	241.3	88,091.5
1976/77	36,473.7	6,162.8	25,429.8	3,139.7	72,206.0
1977/78	42,203.1	6,353.0	32,565.8	--	81,121.9
1978/79	44,652.3	4,235.3	24,968.0	--	73,855.8
1979/80	46,831.1	--	12,972.5	--	59,803.6
1980/81	51,146.8	--	13,547.0	--	64,694.1
1981/82	47,856.0	--	13,363.8	--	61,219.6
1982/83	40,861.2	--	19,970.7	--	60,831.9
1983/84	39,510.0	--	20,866.6	--	60,3[illegible]6.6

SOURCE: Port of Kodiak

B: Southbound

Annual Cargo--Port of Kodiak (SeaLand)
(All figures in tons and data runs from October thru September)

Year	Southbound					
	TL	LTL	Transship	Military	Total	TOTAL
1974/75	28,548.0	900.5	39,334.8	--	68,783.3	142,191.7
1975/76	32,935.6	6,286.6	21,210.6	1,870.8	62,303.7	150,395.2
1976/77	42,120.2	765.8	50,456.3	284.5	93,636.8	164,832.8
1977/78	45,597.6	550.2	70,236.9		116,384.7	197,506.6
1978/79	43,336.5	922.2	59,539.5		103,701.3	177,557.1
1979/80	41,210.1	--	61,143.2		102,403.2	162,206.8
1980/81	50,501.1	--	60,550.6		111,051.7	175,745.8
1981/82	34,941.2	--	28,648.0		63,589.2	124,808.8
1982/83	26,104.7	--	44,693.0		70,797.7	131,629.7
1983/84	34,291.7	--	26,610.7		60,902.4	121,279.0

SOURCE: Port of Kodiak

Foss handles both refrigerated and nonrefrigerated cargo. Much is in containers, though they do handle significant amounts of bulk commerce. Their operation is a pass/pass operation using forklifts on the barge and dock to move material.

Petroleum products are delivered via water transport to the two fuel distributors in Kodiak, Chevron and Union 76. Historically, Chevron's Alaska Standard, a shallow draft tanker with a bulk capacity of 18,000 barrels of diesel, heating, and motor fuel, and 90 tons of other petroleum products, serviced the Chevron dock in Kodiak about once a month. However, this vessel was retired in June of 1985 and replaced with a Foss leased barge. Foss Launch and Tug has been servicing the Union 76 bulk plant with an oil barge since about 1970. A major change in this area will come about now that the Terror Lake facility is on line; there will be significantly less demand for diesel fuel since power no longer comes from diesel generators. This situation should yield more storage capacity for other fuels.

By and large, Kodiak's goods come directly from Seattle. Very few are shipped out of Anchorage. The grocery stores get their potato chips and the lumber company gets some prefabricated supplies out of its main office in Anchorage. The Union 76 and Chevron bulk plants obtain their products from the Kenai refineries, but other than these items, everything else comes out of the West Coast (see Table 236).

During the research for this chapter, several people commented that freight rates have come down significantly since the introduction of competing carriers in the Kodiak markets. Unfortunately, since Foss and Sampson moved to the Lash dock facility, their volume of traffic is not public; without this proprietary information, it is not possible to see how market shares have been adjusted since the added carriers moved into the market. There does seem to be a disparity in prices, which in part may result from the slower barge service. Table 237 summarizes the current rates for Foss and SeaLand. At least two local firms indicated that they were paying lower freight rates as a result of the increased competition.

This structural change cannot be underscored enough. The Kodiak economy has apparently grown enough to sustain more than one sea transport firm. The benefits from this increased competition should last into the future. Thus far there are no indications that this change has altered the cost of living, but it should be reflected in the long run. Without an adequate regional cost of living instrument, it is difficult to observe the results of this kind of structural change.

Air Transportation

Historically, Kodiak has been linked by air to the outside world. Up until 1983, Wien Air Alaska was the principle carrier. Then in 1983 Alaska Airlines built an additional terminal and since that time there have been at least two carriers. In 1985 three air carriers were serving Kodiak. Alaska Airlines had a subcontract with Air Pacific. Three flights per day

TABLE 236

Annual Cargo--Port of Kodiak--All Other Carriers
(tons)

Year	Sealand (Export)	American President Lines (Export Only)	Foss		Others		
			Northbound	Southbound	Northbound	Southbound	Transshipment
1974/75							
1975/76					1,179.9		
1976/77					1,282.3		6
1977/78					2,740.8	119.1	322.8
1978/79	12,671.0	1,875.0			437.5	361	833.6
1979/80	1,730.0	6,983.5			1,081.5	811.9	44.8
1980/81		19,154.1			415.8	155.0	--
1981/82		8,811.3			2,797.7	116.6	989.7
1982/83		6,612.5	3,387.7	608.3	181.2	--	545.5
1983/84		7,562.0	3,619.3	727	--	--	562.8
1984/85			296.0*	119.5*			18.0*

* Partial year--Foss then moved their port to Women's Bay.

SOURCE: Port of Kodiak

TABLE 237

1985 Freight Rates from Seattle to Kodiak and Anchorage
($ per 100 lbs)

Commodity	SeaLand	Foss
Food stuffs:		
0-2,000 lbs	31.05	12.23
2,000-5,000 lbs	27.50	12.23
5,000-10,000 lbs	22.09	12.23
Machinery:		
0-2,000 lbs	26.73	15.85
2,000-5,000 lbs	23.68	15.85
5,000-10,000 lbs	19.05	15.85
Lumber:		
0-2,000 lbs	21.98	15.17
2,000-5,000 lbs	19.48	15.17
5,000-10,000 lbs	15.76	15.17
Steel & Iron (structural):		
0-2,000 lbs	26.73	18.02
2,000-5,000 lbs	23.68	15.85
5,000-10,000 lbs	19.05	13.92

SOURCE: SeaLand Service Company and Foss Alaska

Cultural Dynamics 1986

were scheduled, using either F27 (propjet) or the BA 146 (Stol Jet). Mark Air was using three 737's (taken over from Wien in 1984), and Alaska Aeronautical Industries was flying in Twin Otters, connecting Kodiak and Homer.

In the past, Western Airlines had a direct flight from Seattle to Kodiak on an abbreviated schedule during the summer. This ended in 1979-80. The primary reason for termination of the service was the large number "fly overs" into Anchorage or back to Seattle; approximately 45 percent of the time the planes did not land. Western flew 727's on the route and a combination of poor runway conditions and bad weather created the landing problem. A 2 to 2-1/2 hour time lag elapsed between weather information when the plane left Seattle and its arrival in Kodiak. Once the plane left Seattle, the weather could deteriorate enough that the use of the 727 was marginal.

A competitor's plane, sitting on the ground in Anchorage, was in a much better position to benefit from updated weather information. Also, the chances of landing safely would have been enhanced if a smaller plane such as a 737 had been used, but aircraft scheduling problems precluded the use of this airplane. Western Airlines still believes that the market from Seattle to Kodiak and return is there, but was not considering reentering at the time of this report.

Alaska Airlines, on the other hand, views the market as more of a local one. At the time, Alaska was subcontracting through AirPac because of equipment availability. They, too, cited the problems of using a 727 in Kodiak, but did not have a route structure that could economically utilize the remaining time that an additional 737 would require (on the other hand, linking a Kodiak run with one to Barrow might efficiently utilize another 737). Alaska Airlines' subcontract with AirPac was a substitute for the added plane, as AirPac links with Cold Bay and Dutch Harbor.

SeaAir Motive, an Anchorage firm already involved in Kodiak bush operations, has examined the market with an eye to starting service between Anchorage and Kodiak. They fly the Convair 580, which has a lower operating cost than the Boeing 737, but as of 1985 SeaAir Motive expressed reluctance to enter the market because it appeared to them to be saturated with carriers.

For the most part, it does not appear that air transportation costs to and from Kodiak have been moderated by the increased competition. In 1978 when deregulation started, a round trip to Anchorage from Kodiak was $95.40, which by 1984/85 had increased to $234.00. Deflated by the Anchorage CPI, this increase was from $52 (1967 dollars) to $83, or a real increase of 60 percent. A super-saver fare is $66, a change of 26 percent. Over the same period, real prices between Anchorage and Seattle increased from $136 to $209, or an increase of 53 percent. Super-saver is $175, an increase of 28 percent. Of course, there is a superdiscounted fare structure between Anchorage and Seattle that has no counterpart in the Kodiak market. There does not appear to have been much effect of the added carrier into Kodiak, and price changes have remained behind the highly competitive Anchorage/Seattle market.

A component of the air transportation infrastructure that is extremely important to the economy of Kodiak is the air taxi business. In 1985 there were six bush carriers, including Island Air Service, Air Transportation Services (ATS), Flyrite, Viking Air Service, Uyak Air Service, and SeaAir Motive. This industry forms a vital economic link with Kodiak, the surrounding area, and the bush villages, and competition is brisk. It is a business that entails a considerable amount of risk. In the past ten years at least two persons who owned air taxi operations have been killed in accidents. The weather, coupled with the terrain, imposes formidable conditions on the operators.

SeaAir Motive is the only scheduled bush carrier. In 1983 they were awarded a $480,000 two-year contract from the U.S. Department of Transportation to provide essential service to Ouzinkie, Port Lions, Larsen Bay, Akhiok, and Old Harbor. Previously the contract was held by Kodiak Western Airlines, which went into receivership soon after losing the bid in 1983. This contract was up for rebidding in July of 1985. During the winter months regular service is provided to the villages, but during the busy summer months service is extended to other parts of the island, including the outlying canneries. As part of the service, the contractor carries mail to the outlying areas.

There is no information about market size of the individual operators. Table 238 shows the equipment composition of the various carriers, though this can change quickly as the bush plane is the epitome of "mobile resources." Economic theory would suggest that the carrier with the largest amount of equipment has the largest market share, but other than this inference, no information is available (the Alaskan Transportation Commission is no longer operating and keeping records).

TABLE 238

Air Taxi Fleet Composition

Carrier	Passenger Payload	Related Rate/Hr
Island Air		
1 Piper Navaho (Twin)	8	$350
1 Piper Saratoga (Twin)	6	170
3 Cessna 206's	5	180
1 DeHavilland Beaver	7/1800 lbs	250
ATS		
1 Goose (Twin)	7 or 8	N/A
1 Navaho	8	N/A
1 Cessna 206	5	N/A
1 Cessna 207	5	N/A
1 Widgeon	4	N/A
Flyrite		
2 Cessna 206's	5	$180
1 Bellanca Scout	1	140
Viking		
1 DeHavilland Beaver		N/A
Uyak		
1 Britain Norman Islander (Twin)	4 or 6	N/A
1 Cessna 206	5	N/A
SeaAir		
2 DeHavilland Beavers	7	N/A
1 DeHavilland Otter	10	N/A

SOURCE: Queries of operators, Fall 1984 and Winter 1985
Cultural Dynamics 1986

From discussions with those in the industry, it was learned that each carrier carves out its own niche. Each operator tends to specialize in a particular customer group. The bulk (estimated 65 percent) of Island Air's business is centered in transportation to and from the villages, with sportsmen and hunters accounting for a smaller portion (approximately 20 percent, mainly in the spring and fall), and the remainder accounted for by commercial fishing (15 percent mostly in the summer). Flyrite tends to concentrate more on sportsmen and hunters, commercial fishermen, the Alaska Department of Fish and Game, and the Kodiak School District. They apparently do little work in the villages. ATS tends to fly for a number of different customer groups, including those mentioned above as well as KANA. Competition is brisk, though for the most part it is non-price competition. Market shares can change fairly rapidly as determined by the quality of service.

One possible change in this business sector that may be happening is serving the bottom fisheries. Vessels that are fishing for pollock sometimes need to transfer personnel or obtain equipment, and it is cheaper by far to charter planes out of Kodiak than to bring the vessel into Kodiak. The opportunity cost of a run into Kodiak far exceeds the $250 charter cost for a plane.

HOUSING

Housing in Kodiak has long been in short supply. This shortage has had three primary causes: inadequate financing, little developable land, and a lack of available hookups to the sewer and water system. Rental housing, as well as owner occupied housing, has been in short supply, and as a result the decade of the 1970s and the early 1980s could always have been characterized as "buyers' markets." However, since about 1983 all three of these factors have changed considerably. There has been a major expansion of the sewer and water system into some of the outlying areas (Dark Lake, Island Lake, Spruce Cape, and other), thus increasing the availability of water and sewer hookups.

The increase in the area covered by the sewer and water system has had the same effect as increasing the amount of land. Previously, when a house was constructed off the sewer system, lots were required to be at least 1-1/4 acres. This regulation reduced population density to compensate for the poor percolation in the extremely thin soils in the area. Extension of the sewer system eliminated the necessity for septic systems, thus allowing houses to be built on smaller (1/5 acre) lots, effectively increasing the supply of available land. In addition, more land area was opened up as new roads were built; some access was provided by placing roads on sewer and water easements.

A third change influencing the supply of housing was the Alaska Department of Community and Regional Affairs (DCRA) loan financing that came into Kodiak in 1981, and Alaska Housing Finance Corporation (AHFC) financing that came in the late 1970s. Prior to 1979 the State of Alaska issued revenue bonds to finance housing for certain state residents, and for veterans loans. However, in 1979 state and local bonds issued to cover housing lost their tax exempt status. There was a great deal of political pressure to move the state into subsidizing owner-occupied housing in general.

Thus the Alaska Housing Finance Corporation (AHFC) began issuing bonds (taxable bonds) at the going interest rates. The state then loaned funds and subsidized the first $90,000 of each loan package. The remaining portion of the loan was mixed with the money derived from the bond sales. Thus a loan of $150,000 would be a weighted average of the subsidized portion and the unsubsidized portion (e.g., 90,000 x 11.0 + 60,000 x 17.0 = 150,000 at 13.4%). There is a maximum loan value for each type of structure--$172,900 for single family residences (see Table 239).

TABLE 239

AHFC Loan Summary 1981-1984

		Number	Percent	Average Loan Amount	Total Loan Value
1981	New structures	38	35.14	115,200	4,377,524
	Existing structures	70	64.86	101,200	7,085,890
	1981 Total	108			11,463,450
1982	New structures	29	27.88	106,700	3,093,285
	Existing structures	75	72.12	88,900	6,670.950
	1982 Total	104			9,764,250
1983	New structures	31	43.06	101,500	3,146,559
	Existing structures	41	56.94	76,100	3,118,296
	1983 Total	72			6,264,650
1984	New structures	24	23.76	83,800	2,130,480
	Existing structures	77	76.24	79,200	6,097,160
	1984 Total	101			8,107,662
	Four Year Summary:				
	New structures	122	31.69		12,747,738
	Existing structures	263	68.31		22,852,274
		385			35,600,012

SOURCE: Alaska Housing Finance Corporation

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These loans originate through local financial institutions (commercial banks, savings and loans, mutual savings banks, and mortgage companies) and are then sold to AHFC. The financial institution then services the loan, acting as an agent for AHFC. From the time the program was started to the present, the properties that could be financed include owner-occupied fourplexes, triplexes, duplexes, and single family residences. The loans were originally assumable, but in 1982 were made non-assumable to other buyers of the house. Additionally, AHFC had a 6 percent subsidized loan package for first time home buyers on loans less than $90,000 provided an income test (maximum income) is met. For the most part, banks and commercial institutions who made the loans used standard market prices for determining eligibility for the loans. Emphasis was placed on relatively marketable loan collateral; as a result there were homes that were traditionally not picked up in the AHFC program--rural and nonconforming (nonstandard structures in urban areas) loans.

In 1981 the Alaska Department of Community and Regional Affairs (DCRA) started a loan program to fill the gap. The program is similar to the AHFC loans, but is one percentage point below the AHFC loan rate. The DCRA program has affected areas of Alaska differently. In order to qualify for a DCRA loan in Southcentral (3rd Judicial District) the property needs to be in a community where the population is less than or equal to 4500 and it has to be be more than 100 nautical miles from Anchorage. Areas in Kodiak that lie outside the Kodiak city boundaries qualify.

The DCRA program has three separate parts: two rural and a nonconforming loan arrangement. All structures need to be built to existing code, but can be located off the utility grids. One of the rural programs is a multi-family unit package (up to 16 units with a maximum loan value of $1,250,000), that can be for a non-owner occupied property. For the most part, the Kodiak Housing Authority is the clearinghouse for the DCRA loans. As of early 1985, the total amount of loans made under the DCRA program was $14,780,350 on a total of 140 loans. A summary of the loan amounts (Table 240) reveals that 60 percent were for new structures. As of early 1985 there were no recorded delinquencies on the DCRA loans.

Knowledgeable individuals in the housing finance industry (real estate professionals and the Kodiak Housing Authority) estimate that the bulk of existing financing for homes comes from governmental financing programs (AHFC, DCRA, veterans' programs, etc.). A Coast Guard study places the estimate at 95 percent. Data from DCRA and AHFC indicate about $22.2 million in loans since 1980; however, building permits indicate about $42.5 million for residential construction. Part of this discrepancy comes from the fact that the total value of residential construction includes small projects and alterations. Another factor is that residential construction includes large investor financed multifamily dwellings. Finally, the total has conventional loans that are not state subsidized. The amount of conventional financing is proprietary information, not available to this report. Further complicating the picture is the fact that part of the loans from the state include land value; and the loan is only a portion of the final purchase price (for this analysis it is not possible to adjust for the value of land and the down payment).

Table 240

DCRA Loans in Kodiak
(by fiscal year)

Fiscal Year		Number	Percent	Average Loan Amount	Total Loan Value
1981	New structures	0	0		0
	Existing structures	3	100		168,650
	1981 Total	3			168,650
1982	New structures	5	45	119,800	599,400
	Existing structures	6	55	85,692	511,350
	1982 Total	11			1,110,750
1983	New structures	25	60	108,400	2,710,150
	Existing structures	17	40	74,330	1,858,250
	1983 Total	42			4,568,400
1984	New structures	21	66	124,633	2,617,300
	Existing structures	11	34	84,018	924,200
	1984 Total	32			3,541,500
1985	New structures	33	63	106,867	3,526,620
	Existing structures	19	37	98,127	1,864,430
	1985 Total	52			
					5,391,050
	Four Year Summary:				
	Summary				
	New structures	84			9,453,470
	Existing structures	56			5,326,880
		140			
					14,780,350

SOURCE: Alaska Department of Community and Regional Affairs, Anchorage office.

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Residential Housing

The Kodiak housing market encompasses four geographic areas. These are the city of Kodiak (town), Aleutian homes (modular housing that was originally moved in by the Navy), Monashka Bay and Mill Bay, and Bell's Flats (on the other side of the Coast Guard base). According to the 1970 census, the major portion of the population resided in Kodiak city; however, the expansion of housing that has occurred in the last decade has been primarily in the areas of Bell's Flats, Mill Bay, and Monashka Bay. Thus there has been a significant shift away from the city core toward outlying lower density housing.

Data is sparse concerning housing stock. Periodically the Kodiak Island Borough takes a housing census, the last of which was updated in the fall of 1982. At that time 2,891 housing units were recorded. Previous point estimates of the housing stock are spotty and came from a variety of sources. In 1976 there were an estimated 1,973 housing units. This stock increased to 2,173 in 1978 and 2,773 in early 1982. For the most part these estimates were done by spot checking and verifying building permits. The figures may be low in that not all houses are constructed with authorized building permits. Also, the nature of living in Alaska results in people occupying structures that are not generally recognized as houses (many temporary quarters are never abandoned, etc.). Additionally, since much of the area is without roads, many houses are accessible only by boat or foot, and therefore not easily counted in a survey or census.

Table 241 displays the number of housing units authorized by borough and city building officials. Structures inside the city limits obtain permits from the city engineer's office, and outside the city from the KIB. Note that issued permits are not necessarily completed houses. As can be seen, the rate in the number of permits issued changes over time. In terms of the number of permits, there have been two building booms over the past decade and a half--one in 1977-78 and another in 1982-84. Sixty percent of the total permits issued over the past 15 years were issued during these times. The earlier period coincided with the beginning of the "crab boom" and increased incomes associated with the recovery of the salmon stocks from the early 1970s. The second period resulted primarily from the state subsidized housing program.

Using this data on permits, it is possible to estimate the current stock of housing. Between 1976 and 1982, 858 housing permits were issued. This corresponds with changes in the estimate of the housing stock of 918. The difference probably stems from the fact the survey was done late in the fall of 1982, so it may have picked up more units. Furthermore, timing lags exist between the time a permit is issued and when the building is completed, so we would expect some discrepancy. During 1983 and 1984 there were 272 permits issued, so we estimate there were approximately 3,163 housing units in Kodiak in early 1985. This, of course, does not take into account any conversions or demolitions, for which no data is available.

The dollar amounts expended on residential construction are given in Table 242. Here there is a somewhat different picture than that generated by merely looking at the number of building permits. In terms of dollar amounts, the 1982-84 building boom seems to have been much larger than that which occurred in 1977 and 1978 (these figures are not adjusted for inflation). Also, note that the 1977-78 boom took place within the city of Kodiak, while almost 70 percent of the more recent boom took place outside of it at Monashka Bay, Mill Bay, and Bell's Flats.

Table 241

Housing Units Authorized by Building Permits
Kodiak 1970-1984

	Type					
Year	Single Family	2 to 4 Family	5 or more Family	Mobile Home	Yearly Total	Cumulative
1970	20	0		0	20	20
1971	19	4		N/A	23	43
1972	25	68		N/A	93	136
1973	25	6		N/A	31	167
1974	43	0		N/A	43	210
1975	36	107		N/A	143	353
1976	63	10		1	74	427
1977	53	169		19	241	668
1978	161	22	65	10	258	926
1979	39	7	0	4	50	976
1980	36	12	19	6	73	1,049
1981	48	8	0	8	64	1,113
1982	76	14	48	34	172	1,285
1983	61	42	22	6	132	1,417
1984	88	24	19	9	140	1,557
Total	793	667		97		1,557
Percent	51	43		6		100

SOURCE: Alaska Department of Commerce and Economic Development, Office of Economic Development.

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TABLE 242
Value of Private Sector Building Permits, Kodiak, Alaska
1971-1984

		Kodiak City		Kodiak Island Borough	
Year	Total	Residential	Nonresidential	Residential	Nonresidential
1971	595,000	493,000	82,000	NA	NA
1972	2,341,000	2,159,000	182,000	NA	NA
1973	1,385,000	613,000	772,000	NA	NA
1974	4,294,000	1,418,000	2,876,000	NA	NA
1975	6,902,000	2,637,000	4,265,000	NA	NA
1976	5,388,800	3,326,000	1,147,000	647,900	267,960
1977	7,753,990	5,199,000	1,453,000	1,101,990	-0-
1978	6,644,170	3,270,000	621,000	378,990	2,373,180
1979	3,306,784	1,376,000	810,000	1,107,784	13,000
1980	5,211,118	1,803,159	1,557,298	1,687,523	163,138
1981	8,631,910	2,617,737	3,358,291	2,233,369	422,513
1982	15,992,002	2,265,054	2,503,025	9,840,054	1,383,869
1983	20,517,039	5,474,072	3,985,527	5,887,062	5,170,378
1984	19,147,117	5,873,697	3,089,742	8,315,442	1,868,236

SOURCE: City of Kodiak, City Engineer's Office, and Kodiak Island Borough, Building Inspector's Office.

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The housing census that was done in 1976 and 1978 indicates that single family dwellings composed between 58 and 60 percent of the stock, multiple family dwellings 26 percent, and mobile homes 16 percent. Over the last 15 years just over 51 percent of the permits issued were for single family dwellings, 43 percent were for multiple family dwellings, and roughly 6 percent were for mobile homes. This increase in multiple family dwellings and reduction in mobile homes follows the Anchorage pattern and probably represents a maturation of the housing market.

A part of the process of maturation is the entry of real estate firms as intermediaries. The first real estate firm entered the Kodiak market in 1975. Prior to that the market apparently was not large enough to economically support an intermediary firm, and transactions were probably carried out with minimal support. At present there are three firms, with the additional two entering in 1980 and 1981, respectively. The market as of mid-1985 was served by 13 full-time agents and two appraisers.

As already mentioned, housing in Kodiak historically has been in short supply. Until 1983 there were essentially no rental units on the market, and prior to 1980 few houses were ever offered for sale. Although there are no accurate estimates of the stock of rental units, it is possible to hint at vacancy factors. Table 243 provides information on the rentals and sales offerings in the Kodiak Mirror for the past 15 years, and as can be seen, offerings are few until recent years.

Given the data that we have on the housing stock, we can estimate a vacancy factor. The housing stock consists of housing type and is not given on the basis of tenure. Nationally, approximately 65 percent of the population own their own homes. If this figure is applied to Kodiak (this is probably high, as there has always been a large transient population is Kodiak) in 1976 there would have been (.35 x 1,973) 690 rental units. This yields a vacancy factor of 0.1 percent. By 1982 the estimated vacancy factor was 0.00. Using the estimated housing stock in 1985, the vacancy factor is approximately 2.2 percent. Granted these figures are approximations, but they do provide an indication of the strength of the housing market.

The market for houses for sale has always been similar, but not as tight. Our figures correspond to the perceptions of those in the real estate industry, though they suggest that as of 1985 the vacancy figure is much higher. These observers do assert that prior to 1983 there were zero vacancies. In addition to apartments, houses, and trailers for rent, Kodiak has always had a significant number of rooms and efficiencies available to transient labor. In Gibson Cove (between the city and the airport) are several trailers that have been used as "rental bunkhouses." In addition, during the summer there is always a significant number of the work force living in tents and makeshift houses "squatting" on public and private land.

Construction Sector

CONSTRUCTION EMPLOYMENT

Overall, construction employment has averaged approximately 5 percent of the labor force over the past decade and a half. The major exception

TABLE 243

Housing Unit Rentals and Sales Offered on Market in Kodiak 1969-1985
Early June and December Listings in Kodiak Mirror

	For Sale			For Rent			
Date	Houses	Trailers	Total	Houses	Apartments	Trailers	Total
12/69	NA	NA	NA	3+	5	1	9
6/70	NA	NA	NA	0	6	1	7
12/70	NA	NA	NA	2	1	2	5
6/71	0	0	0	0	0	0	0
12/71	1	0	1	0	0	0	0
6/72	4	0	4	0	0	0	0
12/72	5	5	10	1	3	2	6
6/73	1	1	2	0	0	1	1
12/73	0	0	0	0	0	0	0
6/74	2	0	2	0	0	0	0
12/74	0	1	1	0	2	0	2
6/75	4	1	5	2	0	0	2
12/75	1	0	1	0	2	0	2
6/76	4	1	5	0	0	0	0
12/76	4	0	4	1	0	0	1
6/77	3	0	3	0	0	1	1
12/77	4	4	8	0	0	0	0
6/78	7	2	9	0	1	0	1
12/78	0	4	4	0	0	0	0
6/79	4	1	5	0	5	0	5
12/79	5	1	6	1	8	1	10
6/80	14	0	14	1	2	1	4
12/80	3	1	4	0	4	2	6
6/81	11	2	13	1	1	0	2
12/81	3	1	4	4	1	0	5
6/82	16	3	19	0	0	0	0
12/82	14		14	0	0	0	0
2/83	14	2	16	0	2	0	2
32/83	5	3	8	1	7	2	10
1/84	8	1	9	2	6	1	9
32/84	13	3	16	7	16	2	25
6/85	16	6	22	5	15	1	21

SOURCE: Kodiak Mirror. Houses for sale include condominiums.

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happened in 1982-84 with the construction of the Terror Lake project and the expansion of the housing sector. As a proportion of the labor force, construction employment during these years reached a high of 12 percent (see Table 244). It started to decline in 1984, but was still not down to its previous level, thanks to housing and other public projects (bridge and auditorium).

TABLE 244

Average Annual Construction Employment in Kodiak, Alaska 1970-1984

Year	Total Employment	Construction Employment	Construction as a Percent of Total Employment
1970	2,469	52	2.1%
1971	2,619	61	2.3
1972	2,877	125	4.3
1973	3,575	131	3.6
1974	3,641	206	5.6
1975	3,540	269	7.5
1976	4,426	252	5.7
1977	4,104	212	5.2
1978	4,639	229	4.9
1979	4,831	149	3.1
1980	4,643	101	2.1
1981	4,377	136	3.1
1982	4,392	303	6.9
1983	4,882	582	11.9
1984	4,906	364	7.4

SOURCE: Statistical Quarterly, Alaska Department of Labor

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Traditionally, construction has been highly seasonal in nature. This results primarily from the nature of the physical environment in Kodiak. However, with the maturation of the Kodiak economy and the development of all weather construction techniques, the seasonality tended to moderate. The coefficient of variation has dropped consistently since 1971. The years of the Terror Lake project do not exhibit any cyclical pattern because the project completely swamps the cycle. Total employment over the Terror Lake years followed the construction pattern of the dam, not the seasonal nature of the Kodiak economy (see Table 245).

Contract construction for state projects is governed by AS36.05.010, known as the "Little Davis-Bacon Act." To understand the construction labor sector of the Alaskan economy, clarification is needed of how the different institutions work. The essential content of this law is that wages on state financed projects are required to meet union scale, which is considerably higher than the labor wage rate that exists when a non-union shop is present. So the majority of construction expenditures in Kodiak are governed by "Little Davis-Bacon." Additionally, in Kodiak the main contractors have agreements with the major construction union. Most contractors' agreements with the unions are negotiated by the Alaska Associated General Contractors, although Brechan Construction (a local Kodiak company that is primarily involved in road construction) negotiates on their own.

TABLE 245

Monthly Construction Employment in Kodiak, Alaska for Selected Years

Month	1971	1975	1978	1980	1981	1982	1983	1984
Jan	33	101	130	71	72	120	543	370
Feb	22	119	127	77	71	130	564	354
Mar	28	122	146	92	76	132	573	362
Apr	39	183	213	107	118	185	568	380
May	60	260	261	123	137	218	580	360
June	56	326	292	192	153	262	634	369
July	64	387	281	117	190	338	529	370
Aug	81	447	296	97	175	379	687	368
Sep	81	426	294	106	174	489	697	340
Oct	102	353	253	131	166	516	607	294
Nov	88	281	231	102	149	461	456	272
Dec	73	220	237	88	148	415	448	263
X =	60.58	268.75	230.08	101.08	135.75	303.75	582.16	341.83
S.D. =	25.7	121.7	63.5	17.7	47.2	147.7	77.3	41.26
Coefficient Variation	.4242	.4528	.2760	.1751	.3109	.4862	.1325	.1207

SOURCE: Statistical Quarterly, Alaska Department of Labor

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The component of the industry that is involved in residential construction is different. For the most part the labor is non-union; as a result, it comes for about half the price of the labor found on public construction projects. Second, for residential construction the labor component, in terms of value added, is proportionately greater because there is less demand for highly technical labor inputs; in other words, residential construction is more labor intensive.

The increase in residential construction in Kodiak attracted many small contractors from outside Alaska. The broker for one of the major real estate firms estimated that about 50 percent of the new residential construction was being done by contractors and laborers who had recently migrated from Oregon, Washington, and Idaho. The exact nature of the impact of this "migrating" labor component is unclear. On the one hand, if their moves are permanent the amount of re-spending (the multiplier) would be higher than if they were transient labor. If they are transient labor they would spend part of their income in Kodiak on temporary living quarters, food, etc., but to the extent that they maintained well-defined economic ties outside, a significant amount of income would immediately leak out of the spending stream. Certainly a smaller proportion would be re-spent locally than for someone who maintained Kodiak as their permanent residence.

In summary, with respect to construction labor, it is assumed for this report that 75 percent of the labor involved in large state and public construction projects are non-local labor and 40 percent of the labor involved with construction in the private sector are non-local labor. Further, recognizing the economic ties of those persons who form this migratory component, it is assumed that only half of their income is fed back into the spending stream.

INVESTMENT PATTERNS

Data on investment activity in Kodiak is not readily available from any source, and for the most part private investment expenditures are proprietary. One source, already mentioned, is building permits that are issued by the local governments. The Borough issues permits for all private investment construction activity that is located in the borough, but outside the city boundaries, whereas the city covers those within the boundaries.

The value of the investment is estimated by the officials issuing the permit. The Marshal and Stevens Appraisers Guide, the basic source of information for building costs, is used in valuing the structure or investment. This uniform building guide is associated with the International Conference of Building Officials and is used to estimate the normal costs of construction, which are regionally modified to account for cost differentials. Kodiak's cost adjustment factor is 1.33, where costs in Los Angeles are used as a base.

Data from building permits needs some qualification. First, there is no clear distinction between residential construction and non-residential construction. Kodiak has many independent fishermen and small businesses and the permits are issued to individuals. A structure may be listed as a storage shed, but there is no way of differentiating between one for personal use and one for business use. Secondly, there are many construction projects that never go through the permitting process. This is especially true for those parts of Kodiak where it is hard to get around and the enforcement of building permits therefore is difficult. A third qualification is that once the permit is issued many structures are not built as specified; there is no guarantee that there is a one to one correspondence between the plans and the finished structure. An example of this is the Alaska Airlines terminal at the state airport. A building permit was issued for approximately $750,000, but a conversation with Alaska Airlines officials revealed that the expenditure was in excess of $1 million.

The data on building permits from 1971 through 1984 was provided earlier in Table 242. Residential and non-residential permits are separated. An effort was made to make sure that the non-residential component included only private investment expenditures--no government building permits were included. The data on the building permits is listed by the date on which the permit was issued. In reality actual construction and expenditure of funds for wages, salaries, and materials occurs at a later date. Therefore, when the data is converted into expenditures, these expenditures are time-lagged from the permit period. For expenditures shown in Table 246, it is assumed that 50 percent occur in the year in which the permit is issued and 50 percent are made the following year. This approximation is based on the assumption that building commences once the permit is acquired. Inherent in the assumption is that financing and other arrangements are completed before the permit is issued. Also, some structures are finished in the year in which the permit is acquired, so the two-year span is an average.

TABLE 246

Private Capital Investment Expenditures, Kodiak Island 1980-1985 by Year Spent*

		Year Spent					
Year Started	Total Amt Spent	1980	1981	1982	1983	1984	1985
1979	3,306.8	1,653.4					
1978	5,211.1	2,605.5	2,605.5				
1981	8,631.9		4,306.9	4,306.9			
1982	15,992.0			7,996.0	7,996.0		
1983	20,517.0				10,258.5	10,258.5	
1984	19,147.1					9,573.5	9,573.5
1985	N/A						
TOTALS		4,258.9	6,912.4	12,302.9	18,254.5	19,832.22	9,573.5

* It is assumed that 50 percent of the funds were spent in the year the permit was received and the other half of the funds were spent the following year.

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SOURCE: Table 242

Data on public investment expenditures was derived from the summary of state capital appropriations, as there was no information on capital projects completed. These are used with some reservation in that there is no way to discern whether or not the appropriation was ever spent. However, for purposes here, it was assumed that the appropriations were spent. It was assumed that the expenditures lagged the appropriation by two years. For example, the Terror Lake project was appropriated in FY 1982. It was started in April of that year and was completed in the fall of 1984. It was assumed that one quarter of the public capital project would have been expended in the last half of the calendar year following the fiscal year, and then 50 percent would be expended during the next calendar year, with the last quarter of the project being spent in the following year. Table 247 charts the expenditures that are lagged from the appropriations cited in Chapter V.

TABLE 247

Government Capital Investment Expenditures, Kodiak Island 1980-1985 by Year Appropriated and Year Spent*

		Year Spent					
Year Appropriated	Amount Appropriated	1980	1981	1982	1983	1984	1985
1978	435	108.7					
1979	6,843.6	3,421.8	1,710.9				
1980	10,582.7	2,645.7	5,291.1	2,645.8			
1981	26,156.5		6,539.1	13,078.3	6,539.1		
1982	102,528.9			25,632.2	51,264.5	25,632.2	
1983	19,728.0				4,932.0	9,864.0	4,932.0
1984	16,768.1					4,192.0	8,384.0
1985	34,318.0						8,579.5
TOTALS		6,176.2	13,541.1	41,356.3	62,735.6	39,688.2	21,895.5

* It is assumed that 25 percent of the expenditure occurs in the calendar year that the appropriation is made and that 50 percent occurs during the following year, and the last 25 percent is expended in the year after that.

SOURCE: Chapter V, Table 167

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The impact that construction spending has on the local economy is largely determined by the amount of money that is re-spent in the local economy. The amount re-spent depends on (1) local availability of construction inputs, and (2) goods and services purchased by construction employees. For the most part, with the exception of gravel, quarry material, asphalt, and possibly a few other materials, virtually all of the physical materials are imported into Alaska. Labor, one of the most important, is the primary input that is "available locally."

The Institute of Social and Economic Research has estimated the economic impact of state funded construction projects (ISER Research Summary #20). For every $1 million of state construction spent on schools, the average annual employment generated is estimated to be 5.30 jobs; office construction produces 5.74 average annual jobs; hospitals 5.97 jobs; services produce 4.64 jobs, highway and street construction produce 3.69 jobs, and land reclamation 6.19 jobs. For this analysis, an overall average of 5.5 is assumed. The ISER report estimates that overall labor payments (onside wages and salaries) accounted for 25.8 percent of public schools, materials and supplies accounted for 55.2 percent, and overhead and profit were 19.0 percent.

Discussion with private building estimators provided some basis for comparisons. Because private residential construction is less unionized than public projects, it is lower priced. Also, private residential construction is more labor intensive than public construction. Based on the ISER estimates, the private building estimators suggested that 9 jobs on an average annual equivalent basis would be a close approximation of the employment impact.

This allows us to make estimates of the amount of employment that has been generated by the local private and public infrastructure projects. This data is presented in Table 248, along with the actual construction employment. The estimate is fairly close to that observed. Although this is primarily an estimate and is based on assumptions concerning the timing of expenditures, it nevertheless provides a check on the magnitude of investment expenditures in Kodiak.

The impact of the construction projects in terms of money spent in the Kodiak economy also can be estimated. It is assumed that only 20 percent of the labor force on the public investment projects are local Kodiak residents, but that 50 percent of the construction employment in the private sector are local residents. All of the income of the local residents is assumed to flow back into the local economy. On the other hand, it is assumed that of the non-residents, only 25 percent of the income is spent locally, and that most of it flows back to their respective places of residence. This last assumption is an estimate recognizing that even non-locals spend a portion of their wages and salary in the local economy.

Further, it is assumed that of the total spent on construction, 25.8 percent is the wage and salary component (ISER Research Summary #20). And we assume that inputs are purchased locally, which seems to be the case, especially in small private residential construction. In 1985 local suppliers

Table 248

Estimated Construction Employment from Private and Public Sectors in Kodiak, 1980-1985

Year	1980	1981	1982	1983	1984	1985
Private Capital Expenditures	4,258.9	6,912.4	12,302.9	18,254.5	19,832.2	9,573.5
Estimated Employment in Private Sector*	9	38	62	116	165	178
Public Capital Expenditures	6,176.3	13,541.1	41,356.3	62,734.6	39,688.2	21,895.5
Estimated Employment in Public Sector**	5.5	34.1	74	225	345	218
Total Capital Expenditures	10,435.2	20,453.5	53,659.2	80,989.5	59,520.2	31,469.0
Estimated Construction Employment	72	136	335	510	396	
Actual Construction Employment	101	136	303	582	364	

* Private construction projects are assumed to provide 9 jobs on an annual equivalent basis.

** Public construction projects are assumed to provide an average of 5.5 jobs on an annual equivalent basis.

SOURCE: Tables 246 and 247, and ISER Research Summary #20, Economic Impacts of Capital Spending in Alaska.

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were experiencing a boom. The local lumber yard manager was the most optimistic person encountered during the field work for this project. These figures are somewhat low, but there is no way to estimate this residual.

As a result of investment expenditures, it is estimated that between 1980 and 1984 income available locally increased from $.686 million to $5.11 million as a result of private sector building. This figure for the public sector was $1.7 million to $9.332 million (see Table 249).

TABLE 249

Estimated Construction Income Available for Spending in Local Economy in Kodiak, 1980-1984

	1980	1981	1982	1983	1984
Total Private Capital Expenditures	4.258	6.912	12.302	18.254	19.832
Total Wages & Salaries (.258)	1.098	1.783	3.179	4.710	5.11
Locally Available Income (.625)*	.686	1.114	1.986	2.94	3.19
Total Public Capital Expenditures	10.435	20.453	53.659	80.980	59.520
Total Wages & Salaries (.258)	2.692	5.277	13.844	20.893	15.356
Locally Available Income (.4000)**	1.077	2.111	5.538	8.357	6.142
Total Income Available Locally	1.763	3.225	7.523	11.297	9.332

* 50 percent plus 25 percent of the remainder
** 20 percent plus 25 percent of the remainder

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Prices and Infrastructure

Kodiak/Shumagin region residents, like all Alaskans, pay higher prices for goods and services than residents who live elsewhere in the United States. However, there are substantial variations between the prices that are paid by people in different parts of Alaska. The variations depend not only on the composition of the goods people buy, but where they live. For the most part, prices are the lowest in Anchorage and the state's other urban places, and prices are highest in the bush areas and small villages away from the central distribution infrastructure.

These price differentials arise from many causes. Economists cite transportation costs to and within the state, high construction costs, uncertainty and delays in shipping and construction due to the harsh climate, small Alaskan markets, large seasonal fluctuations in the production and distribution in many Alaskan industries, and rapid change in industry and governmental activity which in the past have alternatively created shortages or surpluses of goods in the state (boom and bust patterns of expansion).

Information about living costs based on long-term data gathering is available only for Anchorage. For the most part, information on prices for other Alaska areas is available only sporadically; there is no methodically consistent periodic measure. The CPI for Anchorage (the most often used measure) has been questioned in terms of treatment of housing, so it is not clear as to whether or not the index currently provides an accurate measure of inflation in Anchorage.

The major national series that actually compared regional living costs (the Bureau of Labor Statistics' family budgets) was discontinued in 1981, and the measuring device that has been implemented in its place is not as methodologically sound. The current American Chamber of Commerce Researchers Association publishes an index that "provides a reasonable indication, rather than a precise measure" of regional price differences. Also, Rurzheimer International provides some information on regional cost of living differences (for a subscription price of $15,000 to $20,000/year). Information between Anchorage and other Alaskan cities, based on several different studies, is spotty at best, and there are wide variations in the measured differences.

CONSUMER PRICES

Anchorage and Kodiak

The Consumer Price Index (CPI) provides primary long-term price measures. This index is important because it is the only measure of how inflation in Alaska compares to the rest of the U.S. as a whole. Its value has grown since the family budgets were discontinued in 1981. By comparing how prices have changed in Anchorage relative to how they have changed in the rest of the U.S. gives a cursory indication of whether the price gap between Alaska and the rest of the country is narrowing or widening.

Over the last two decades the change in the CPI for Anchorage has increased less than the U.S. city average. From 1967 to 1985 the CPI increased by 205 percent, while in Anchorage it increased by 171 percent. However, there is some question as to the accuracy of the housing component. If this component is eliminated, the difference in the two indexes is much closer, 190 and 188 respectively. There are some variations over time, but for the most part it appears that prices have increased in Anchorage more slowly (with the exception of the pipeline construction years) than the rest of the U.S. Three forces are considered at work here: population growth has increased market size and economics of scale in distribution have been created; more competition has ensued with an increase in the market size; and there has been a reduction in costs of transportation.

To some extent these same forces have been evident in Kodiak. As previously noted, there has been an increase in size of the market, allowing for more entry of minimum efficient scale retail outlets, and additional freight carriers have entered the market. However, it is not clear whether the price differences between Kodiak and Anchorage have narrowed as a result. Information on price differences between Anchorage and Kodiak is spotty and there is no historically consistent measure. The best that can be done here is to note some of the indexes that have been used at various times.

From 1951 to 1979, the Alaskan Agricultural Experiment Station in Palmer published a quarterly survey of food prices in various Alaskan communities. The survey used a market basket approach, though only 45 food items were (as opposed to about 200 for the CPI). The series put in index form is listed in Table 250 for Kodiak. Again, this index did not measure goods that people in Kodiak actually purchased, but rather the cost of purchasing the 45 items included in the survey. In 1979 the University of Alaska Cooperative Extension Service began making the periodic surveys of various Alaskan communities. Like the earlier work, a market basket approach was used. The survey included the costs of buying approximately 100 items from the federal government's low cost food plan (a scheme that provides minimal nutrition for a family of four). From 1979 through 1983 the survey used the goods as listed in the 1964-65 Survey of Consumer Expenditures; after 1983 the survey used the new family food plan from the 1977-78 Nationwide Food Consumption Survey. The results of the survey are presented in Table 251.

Both Tables 250 and 251 seem to indicate that relative to Anchorage, food prices in Kodiak have not kept pace. It appears that compared to Seattle, prices in Anchorage have fallen (even though this is not borne out by the CPI figures). This would make sense because there has been a maturation of the Anchorage markets (lower transportation, regional warehousing, and increased competition). However, it does not appear as though Kodiak has had similar benefits. Kodiak's food prices seem to have remained the same relative to Seattle food prices and increased relative to Anchorage's prices. To some extent, this is surprising, considering the increased competition in the retail food industry in Kodiak. In 1975 there was one major retail food supplier but by the early 1980s two additional entrants were in the market. It must be remembered, though, that the distribution system for this industry comes directly from Seattle.

While gathering data for this project, some residents of Kodiak offered their impression that prices in Kodiak had not changed relative to Anchorage. The primary impact of increased competition they saw was an increase in product diversity and availability, but little decrease in prices. This would seem to be supported by what information is available.

TABLE 250

Ratio of Food Costs in Kodiak, Alaska, Compared to Anchorage and Seattle, 1963-74
Anchorage = 100

	1963	1965	1967	1970	1972	1974
Kodiak	101	103	102	113	112	106
Anchorage	100	100	100	100	100	100
Seattle	78	N/A	76	83	83	81

SOURCE: "Retail Prices of 45 Food Items in Thirteen Alaska Cities," Palmer, Alaska, Agricultural Experiment Station.

Cultural Dynamics 1986

TABLE 251

Weekly Costs of Food at Home Index for a Family of Four Under Low Cost Food Plan for Kodiak and Anchorage

	Kodiak		Anchorage
Date	Anchorage = 100	U.S. = 100	Seattle = 100
June 1979	109	148	136
September 1970	112	144	127
December 1982	132	156	118
March 1983	145	156	108
June 1983	N/A	155	N/A
September 1983	129	140	109
March 1984	135	139	102
September 1984	138	149	109

SOURCE: University of Alaska, Cooperative Extension Service, Fairbanks, Alaska.

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Other than grocery and food costs, specific price comparisons are sketchy. The extension service does selectively price a few other commodities at its various sample points, with Anchorage and Kodiak included. The time period for the data is not long, but some indication of cost differences exists. As can be seen from Table 252, the price differences are significant. Perhaps the most telling is the electricity price, which is far higher in Kodiak than Anchorage (though the cost in some remote villages is much in excess of these amounts). There is no way of quantifying how these prices affect the overall cost of living, but they are indicative of Kodiak's higher costs. Of course, there would be correspondingly lower weighting of these higher priced goods, as the consumers attempt to conserve on high priced goods.

TABLE 252

Prices of Selected Non-Food Items in Kodiak and Anchorage

	June 1979			September 1984		
	Kodiak	Anchorage	Kodiak % of Anchorage	Kodiak	Anchorage	Kodiak % of Anchorage
Electricity (100 kwh)	156.00	32.00	515	158.00	60.47	216
Heating Oil (55 gal.)	40.15			55.39	81.55	68
Gasoline (unleaded auto--55 gal.)	57.20	47.85	119	65.45	59.95	109
Lumber (2"x4"x8')	2.20			2.97	2.00	148.5
Propane (288 gal/100#)				46.40	39.60	117
Water & Sewer (1000 gal.)				37.50	28.30	132.5

SOURCE: University of Alaska, Cooperative Extension Service, Fairbanks, Alaska

Cultural Dynamics 1986

Cost of Living Differentials

There have been attempts to measure cost of living differentials within the state. The state government pay system incorporates cost of living differentials and several state agencies recognize cost differences in calculating payments. The University of Alaska and state government at the time of this study paid salary differentials (Anchorage = 100) of 115 and 107.3 in Kodiak. The State Dept. of Education recognized a cost of living differential of 112.6 for Kodiak in the operation of the foundation program. For the most part, there has not been consistent methodology in arriving at these different measures, and there have been no consistent measures taken through time. State studies generally compare costs of the same or similar items in the various communities, but except for the urban areas, many of the items are not available, or not part of the commodities purchased by residents of the respective communities.

Most studies have measured living costs in the larger communities away from Anchorage (Kodiak, Barrow, Nome, etc.), where substantial differences do exist. But for the most part there has been little done to evaluate differentials between the urban areas and the smaller villages. This is especially true for the smaller communities in Kodiak and the Chigniks. Electric power costs have been documented. AVEC villages have power costs (including the power cost assistance program) which exceed those in Anchorage by 243 percent. Other than this information, not much data gathering has been attempted.

Measuring living cost differences between Kodiak and the bush villages is a difficult task. The composition of the typical budget differs markedly. There are both qualitative and quantitative differences. Generally a market basket approach is used where the same goods are priced in different places, but often goods are not available in the villages; there are quality differences; and the relative quantities that are purchased are substantially different, making comparisons difficult. Finally, life style differences, sometimes forced by higher prices and limited availability of goods, make comparisons tenuous. For example, housing in Kodiak and the bush villages is not really comparable. A typical house in the outlying communities differs substantially from one in Kodiak in terms of elements like size and quality. Attempts to look at price differences would need to standardize these sorts of dimensions.

Similar hurdles are encountered in other components of a budget, and where quality components are not extreme, quantitative weighting problems exist. For example, the food basket purchased in Kodiak city is made up of a wide variety of goods; in the villages purchased foods may be complemented by a relatively larger subsistence component. The weighting of many items in the respective typical food baskets would thus have to differ markedly. Geographical location may also affect what people purchase. Certainly air travel forms a larger component of the budget in the bush. The communities are not on a road system, so groceries and fuel arrive either by boat or by air. The communities, for the most part, do not have extensive systems of public utilities, and this affects the composition of the "market basket."

During the course of this study, a survey was taken in various areas of some prevailing prices in an attempt to provide indications of the magnitude of price differences. The results of this survey are presented in Table 253. In no way does the data constitute a market basket; it is an average price of a list of eighteen representative grocery items. It is some information (albeit a limited amount) on prices. It is not a weighted average, and every item was not sampled in every location, but it does tell us something about prices. Attempts were made to survey the same items, but the limited availability of goods in the villages made this difficult.

These data on prices are not surprising, in that the closer to Kodiak the lower prices are on average. Also, it must be remembered that proximity to Kodiak reduces the degree of market power of the seller. Additionally, one would expect that the prices are cost driven. Port Lions is serviced by ferry, and thus has a direct link with Kodiak, at relatively low cost, whereas the outlying communities are tied to Kodiak only by air or an occasional boat and/or tender service. In this case, residents in the outlying communties purchase goods in Kodiak and Anchorage, and have them shipped out by boat and plane; thus the transportation costs serve as a price umbrella.

TABLE 253

Average Prices on Eighteen Representative Grocery Items in Selected Kodiak and Chignik Area Villages (Kodiak = 100)

Village	Index	Number of Items Sampled
Kodiak	100	18
Akhiok	173	9
Old Harbor	139	6
Port Lions	108	11
Larsen Bay	120	10
Perryville	152	4
Chignik Lagoon (CWF Store)	114	11
Chignik Bay	131	10
Ivanof Bay	158	8
King Salmon	143	12

Sampling done in Spring of 1985. Items included bananas, potatoes 10 lb., coffee 1, 2 & 3 lb., disposable diapers, eggs, bacon, flour (5 & 10 lb.), sugar (5 & 10 lb.), ice cream (1/2 gal.), peanut butter (27 oz.), paper towels, pilot bread, toilet tissue, and soda pop.

SOURCE: N.Y. Davis Field Research

Predominantly the villages on Kodiak Island are tied economically (from the standpoint of costs and resupply) through the infrastructrue in Kodiak city, although there are some supplies that annually come up directly from Seattle. Kodiak serves the Bush villages in two ways. Krafts acts as a grocery wholesaler to the small village stores (Walt's and the Old Harbor Store). Also, Krafts and the other stores in Kodiak (City Market and Mark-It Foods), as well as some stores from Anchorage, fill bush orders. Lists are sent in which are filled and shipped out by boat or where there is no scheduled boat service, by air. SeaAir, which has the island mail contract, flies a schedule to and from the villages and charges 29¢ per pound for air freight. Island Air Service, one of the main air taxi operations, is also a major carrier to the villages. Mark-It Foods in Kodiak established stores in Larsen Bay (1983), Ouzinkie (1979), and Port Lions (1984), and supplies these stores primarily by boat. In addition to the distance from Kodiak, the presence of competition within a village may influence prices. Of course, other factors could be present. These could hardly be considered efficiently functioning markets.

Prices in the Chigniks also appear to be significantly higher than in Kodiak. This again is hardly surprising, given the location and costs of transportation. Aside from air service, the primary transportation infrastructure for these villages is four sailings on the State Ferry System each summer, and the annual BIA Alaska Resupply Operation from Seattle (sponsored by the Dept. of the Interior, BIA, Seattle Support

Center). A comparison of costs for shipping food items (groceries) indicates significantly higher freight rates for the Chigniks than for Kodiak or Anchorage. Cost of shipping to Chignik from Seattle is $14.75/100 lbs., and this is only done once per year, whereas Kodiak receives goods every two weeks and rates start at $12.23 for LTL (less than trailer load) and drop to as low as $5.16 for large (>28,000 lbs.) shipments.

The other source of supply that the Chignik villages depend on is bush orders from Anchorage. Four firms in Anchorage process "bush orders." Generally, upon receipt of payment and a list of desired items, an order is packaged and shipped to the bush destination. The firms in Anchorage are Patrick's, Alaska Grocery Supply (these two process bush orders exclusively), Prairie Market, and Proctors. Patrick's handles a few accounts on Kodiak and about 30 accounts in the Chigniks, whereas Prairie Market has two or three in the Kodiak villages, and approximately 20 in the Chigniks. Alaska Grocery Supply has one account in Kodiak and four in Chignik. Proctors services one or two in the Chigniks and one in Cold Bay.

Usually these orders are on a cash basis, though credit is sometimes extended to well-established customers. The goods are generally shipped via parcel post (the rate is 11¢/lb., with a maximum size package of 70 lbs.), although occasionally air freight is used. Most often dry goods are shipped, with perishables infrequently sent. There is a substantial postal subsidy in that it has been estimated that the cost of shipping a 50-pound box by air to a representative bush destination is about $50, whereas the Post Office charges $3.50. The remaining $46.50 is subsidized by the postal system.

Summary

Over the decade examined in this study investment in public and private infrastructure in the town of Kodiak proceeded at rates significantly above previous levels. Aside from the rebuilding that took place after the 1964 earthquake, the 1970s and early 1980s marked extensive changes in the physical capital of the Kodiak economy. Major public projects included the Terror Lake Project, Near Island Bridge, Dog Bay Boat Harbor, and expansion of the water and sewer system; all will have significant effects on the future development of the Kodiak city economy.

The expansion of both the private and public infrastructure during the period came from state spending, supported by oil revenues, and from the fishing income that resulted from the good harvests and high prices of salmon and crab in the late 1970s. Employment that resulted from the public investment expenditures had relatively small effects. The larger the project the smaller was the proportion of local residents that were employed. This stems from the composition of skills available in the resident population.

Except for 1983 when the Terror Lake project was at its height, construction employment between 1970 and 1984 averaged about 5% of the labor force. Highly seasonal in the earlier years, employment patterns moderated over the period. A major impact of private construction investment was in housing, a difficult sector to measure.

Although data providing details are sparse, living costs are recognized to be higher in places like the Kodiak/Shumagin region than in urban areas like Anchorage and Seattle. The magnitude and rates of change in these differences are influenced by forces such as an increase in the size of the market, economies of scale, and reduction of transportation costs. All of these took place in Kodiak during the study period. It is not possible to specify the consequences for the cost of living, however.

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VIII. SOCIOCULTURAL SYSTEMS OF KODIAK CITY, ALASKA

by James Payne, Ph.D.

Introduction

This chapter examines recent changes in selected sociocultural characteristics of the town of Kodiak. The years examined are 1979 through 1984. In 1979 and 1980 some baseline studies were conducted by the OCS Office of the Bureau of Land Management (Alaska Consultants, 1979; Payne 1980). This report builds on those earlier studies. The major emphasis of both this and the earlier work is to highlight elements that might be vulnerable to OCS impacts; we have tried to address only those pertinent to potential petroleum development. Not all changes in Kodiak are relevant to OCS development, so selectivity has been exercised.

METHODOLOGY

The research for this project relied heavily on focussed discussions and informal contacts. Sixty-one individuals were contacted for the discussions and/or for specific data. Others provided information in informal situations, usually of shorter duration. The data were obtained in the following manner. Field work was conducted in Kodiak city in the fall and winter of 1984-85. During the on-site investigation, informal discussions were conducted with individuals knowledgeable about specific sectors of the sociocultural systems. Depending on the complexity or pertinence of the sector, several individuals were contacted often through a "networking" of individuals familiar with each other.

The structured discussions were with people who occupied key socioeconomic and sociocultural positions within the town's organizational structure. These individuals not only held professional positions, often as agency or sector representatives, but they also possessed the education, interest, and experience to provide perspective and insight in to the historical and contemporary dynamics of life in Kodiak. The distribution of these contacts will be found in Table 254. Several people contacted for this study were the same individuals seen in 1979. This feature provided a larger historical perspective to the research, because the individuals who were interviewed twice over a six year period were witnesses to socioeconomic changes that occurred in Kodiak during a critical period.

Besides the discussions, data was obtained from agencies in Kodiak city. When information could not be obtained there, inquiries and requests were made to agency branches in Juneau, Anchorage, or other locations. Finally, additional materials were obtained from libraries and research institutions in Anchorage. Copies of Kodiak newspapers were also analyzed. The information from secondary sources was placed in the larger framework of the project to validate the findings acquired from the key informants. Therefore, the research approach did not accept only the perspective of a few individuals. Rather, their information was checked and rechecked against the perspective of other sources of data.

TABLE 254

SOCIOCULTURAL SYSTEMS OF KODIAK CITY DISTRIBUTION OF CONTACTS

Affiliation of individual	Number contacted
FEDERAL	
Coast Guard	
Administration	4
Planning	1
Housing	1
Chaplain/Support Center	2
Rescue Coordination	1
Civilian Personnel	1
STATE	
Health andSocialServices	3
Transportation and Publ. Fac.	1
Marine Safety	1
Labor (ESC)	1
KODIAK ISLAND BOROUGH	
Mayor	1
Manager	1
Planning	2
Mental Health Center	1
Alcoholism and Drug Abuse	2
CITY OF KODIAK	
Mayor	1
City Clerk	2
Finance	1
Police Department	3
Fire Department	1
Harbormaster	1
OTHER GROUPS	
Women's Resource & Crisis Ctr	1
Draggers Assoc.	1
Marine Advisory	1
Chamber of Commerce	1
Retail Merchants Assoc.	1
Filipino Community	2
Orthodox Church	1
School District	3
FISHING SECTOR	
Fishermen's Wives Assoc.	5
Fishing families	6
OTHERS	
Non-fishing families	7

BACKGROUND

The town of Kodiak is on the northeastern edge of Kodiak Island, which is located on the western edge of the Gulf of Alaska. It is approximately 330 miles southwest of Anchorage. The town is backed by high mountains and fronted by a series of small islands seaward. The closest of these is Near Island, which is included in the City of Kodiak.

A newly constructed city boat harbor is located in Dog Bay between Near Island and Uski Island. Directly across the channel separating Near Island from Kodiak city is Saint Paul's boat harbor, constructed after the 1964 earthquake. To the left of the boat harbor is "cannery row," an industrial area of seafood processing and ocean freight docking. For a short distance along the waterfront to the right of Saint Paul's boat harbor are more seafood processing and docking areas. Behind the waterfront is the main retail and residential area. The residential area continues northeast past the city limits to Spruce Cape, Mill Bay, and Monashka Bay. Much of this "road-connected" area is in the Kodiak Island Borough, outside the jurisdictional limits of Kodiak city.

Historically, the area has long relied on marine resources. People were living on Kodiak Island at least 7,000 years ago (Clark 1984). Though the archaeological record reveals a series of cultural traditions on the Island, it was the Koniag who were in residence at the time of Russian arrival in the late 1700s. In 1792 Alexander Baranof established a settlement at Chiniak Bay, the location of present-day Kodiak city. American control began in 1867 when Russia sold its interests in Alaska to the United States. The major enterprise during these times was harvesting furs. The exploitation of pelts led eventually to the near total extinction of sea otters.

The town has experienced severe natural disasters. On June 6, 1912, Mount Novarupta (Katmai), believed to be an extinct volcano, erupted. Thick volcanic ash rapidly began to fall on Kodiak Island. Though the volcano was nearly 100 miles away, up to 18 inches of ash fell on the town. At first it appeared it would have to be abandoned, but eventually the disaster was overcome and the town recovered.

On March 27, 1964, the Great Alaskan Earthquake dramatically altered the Kodiak Island area. It was not the earthquake itself that caused the most damage, but rather earthquake-induced tsunami. In the town of Kodiak, forty percent of the downtown business area was ruined; many fishing vessels were lost. The total damages exceeded several millions of dollars. Seventeen people lost their lives in the catastrophe. At first, economic prospects after the disaster looked bleak. However, as with the 1912 volcanic eruption, Kodiak rebuilt.

Other events have changed the community. Before the Second World War Kodiak was a "sleepy little" fishing village. But response to Japanese actions led the Navy to institute military preparations. In 1939 construction on a naval base began about seven miles outside of town. Kodiak's 1939 population of 864 had risen to 3,500 by 1941. At a high point it was estimated there were 15,000 soldiers, 5,000 construction workers, and several thousand sailors and marines on Kodiak Island (Chaffin 1967:56). The postwar years saw steady modernization. In the 1960s an electric association was established, the water and sewer systems were built, as was a new small boat harbor. There were also other improvements to the transportation and communications systems.

In 1882 a fish cannery was opened at Karluk spit. This event signaled the beginning of industrialized commercial fishing in the region. Fishing grew over the years as a central economic sector in the community. The crab industry began to expand in the 1960s; Kodiak was becoming a modernized and important fishing port. By the late 1970s and the early 1980s Kodiak had become the dominant fishing port in Alaska.

POPULATION

Table 255 shows how the population of the town has grown over the years. It is difficult, however, to determine an exact number. Like many other Alaskan towns, Kodiak's population fluctuates with the seasons. In August the population can be 120 percent of the annual average, shrinking to 83 percent during March (Alaska Consultants 1979:26). The figures in Table 255 represent best estimates. The largest period of growth was between 1960 and 1984, the years of rapid expansion of the fishing industry.

TABLE 255

Population of Kodiak City: 1880-1984

Year	Number	Year	Number
1880[1]	288	1960	2,628
1890[2]	495	1970	3,798
1900[2]	341	1977	4,260
1910	438	1980	4,756
1920	374	1981	5,754
1929	442	1982	5,873
1939	864	1983	6,027
1950	1,710	1984	6,469

[1] Referred to as Saint Paul
[2] Referred to as Kadiak

SOURCES: 1880 through 1970--Rollins (1978).
1977--Kramer, Chin and Mayo (1978).
1980--U.S. census, U.S. Dept. of Commerce (1981).
1981 through 1984--Kodiak Island Hospital Long Range Plan, draft (1985-9).

In 1970 the city's sex ratio was 54 percent male to 46 percent female. This ratio has persisted into the 1980s (U.S. Department of Commerce 1982: 3-45). The proportion is similar to the Alaskan profile but quite different from the national norm, where females slightly outnumber males. Part of the explanation for this difference is the large number of transient male fishermen and cannery workers who come to Kodiak for the seasonal job opportunities. Ethnically, the town of Kodiak is predominantly white. The next largest group is Native Alaskans, mainly Aleuts, followed by Asian groups, predominantly Filipino. In recent years, slow down in the fisheries, the Asian population has been steadily declining.

GOVERNMENT

Kodiak was incorporated as a first class city in 1940. It is a home-rule city with a city manager/council form of government. There are six members on the city council, plus the mayor's position. In 1984, of the six city council members, two were directly engaged in the fishing industry and one was involved in it part time. The departments within the city include: city manager, city clerk, finance, police, fire, public works, port of Kodiak, parks and recreation, and library. The city has a sales tax of 5 percent and a hotel/motel (transient room) tax of 5 percent.

Real and personal property taxes are administered through the Kodiak Island Borough. In 1985 the basic mill rate was 3.75 mills on both real and personal property. Most personal property items have been exempted from tax except for business equipment. Personal property taxes within the city of Kodiak are paid out of the city's general fund. Vessels used to be eligible for the personal property tax; however, a few years ago the borough decided on an annual flat fee instead, with vessels under 5 tons paying $5.00 and vessels over 5 tons paying $15.00. In 1984 this policy was modified so that vessels under 5 tons pay no fee (the administrative costs exceeded the $5.00 fee). For vessels over 5 tons registered within the city, the $15.00 fee is paid by the city.

On taxable real property within the city there is a 3.75 borough mill rate and an additional 2.0 mill rate for the city itself. Approximately 66 percent of the money raised by the borough through real property taxes is used to support the Kodiak Island Borough School District. Outside the city limits the mill rate varies above the basic 3.75 mills, depending on the requirements of special service districts, Native land status, and similar considerations.

School System

Educational services are provided to city residents by the Kodiak Island Borough School District, which serves all of the Island's school age children. In addition, two religious schools enroll a small number of students. The school district's facilities in the city include Main, East, and Peterson elementary schools, Kodiak Junior High, and Kodiak High School. Peterson elementary mainly serves the Coast Guard base and road-connected areas.

Enrollment has remained fairly constant over the years. During the 1970s it averaged just over 1,800 pupils. There was a slight decline in the 1980-1981 year, with figures returning to the average through 1983-1984. Early figures for the 1984-1985 year indicated an increase in student population, which is contrary to the notion of families leaving because of the decline in the fisheries. Where the increase in pupils is originating is not clear.

Higher education is provided by the Kodiak Community College. The college began operations in 1968 with 95 students and eight classes in space provided at the local high school. In 1972 facilities began to be developed on local campus space. By 1984 the college offered 200 classes and had an enrollment of 1,300 students. The college offers G.E.D. services, vocational and academic coursework that may lead to an associate degree, and recreational coursework and personal enrichment courses. It also sponsors the Fisheries Institute, which advances fisheries information to Kodiak's fishermen.

Health Services

Medical services in Kodiak are provided by the Kodiak Island Hospital and by the three physicians in town who have their own clinics. Currently the hospital has eleven physicians as members of its active medical staff, and eight as courtesy staff. The courtesy staff physicians are from out of town and offer specialty clinics in the hospital on varying occasions. The resident doctors provide a wide range of specialized services. The hospital is currently licensed for 21 medical-surgical beds and four obstetrical beds. There is also a 19-bed intermediate care (long-term care) unit attached to the hospital.

Hospital services originally began in 1939 with the Griffin Memorial Hospital. In 1944 the Catholic order of Grey Nuns began operating the facility. In 1968 a new building was constructed and a non-profit corporation was organized to administer the hospital. This corporation consisted of three Grey Nuns and two laymen. The hospital building itself belongs to the borough, which was financially responsible for it, although the actual operations were to be self-supporting. In 1977 the Grey Nuns ceased participating in the hospital, and since 1979 it has been run by the Lutheran Hospital and Homes Society. The same arrangement exists as did earlier, with a non-profit corporation in charge (Kodiak Island Hospital Long Range Plan 1985).

Medical services for Coast Guard personnel are provided at an on-base hosptial. Illness or injuries that cannot be treated on-base are transferred to the U.S. Air Force hospital at Elmendorf Air Force Base, or treated locally at the Kodiak Island Hospital under a special services program. Natives residing in Kodiak have their health care needs met through Indian Health Services contracted through Kodiak Area Native Association (KANA).

Utilities and Other Services

A full range of conventional services will be found in the town. Electricity is provided by the Kodiak Electrical Association, which has had diesel generated power since 1942. The rising cost of fuel spurred in some a desire for an alternative source of power, and hydroelectric generation at a nearby lake was proposed as an answer. This is the Terror Lake Hydro Project, on which construction began in 1982. On December 13, 1984 the system went on line producing 20 megawatts of power; it is expected to provide all of Kodiak's power for the near future. Kodiak's water and sewer services are both operated by the city of Kodiak. There are two radio stations and a cable television station. More detail on these systems, as well as on transportation and other community services, is presented in other sections of this report.

U.S. COAST GUARD

A U.S. Coast Guard base is located near the town of Kodiak. Though not a part of the city, the base and its personnel play an active role, both economically and socially, in Kodiak. Initially, the base was developed by the Navy in 1939. Though the Coast Guard had units operating in Kodiak since 1947, it was not until 1972 that this location officially became a Coast Guard base. In that year the Navy decommissioned the facility for its purposes.

The Coast Guard maintains several commands at the base. One is the Support Center, which is responsible for overall administration of the base. Another, the Air Station Command, has C-130 airplanes and helicopters and is responsible for logistic support, law enforcement, fisheries patrol (enforcement of the "200 mile limit" laws) and search and rescue. The third command is the communications station at Kodiak. Besides Coast Guard and other governmental communication, this unit handles distress calls from Alaskan and North Pacific waters, including those from fishing vessels. Also, the Coast Guard operates two loran sites (Narrow Cape and Spruce Cape) to provide navigation signals.

Four large ships are stationed at the base; each is considered a separate command. The Yocona (213 feet 6 inches in length) and the Storis (230 feet in length) are primarily assigned to law enforcement duties, though they can perform others, such as search and rescue. The Ironwood and the Firebush (both 180 feet in length) have the major responsibility of maintaining aids to navigation (tendering buoys for example). Like the other two vessels, they can perform other functions such as search and rescue and law enforcement.

The final command at the Kodiak station is the Marine Safety Detachment. This group is concerned with commercial vessel inspection, vessel casualty investigation, marine environmental protection, and port security/law enforcement. There is the possibility of an air station being established at Cold Bay in the future, which would be administered from Kodiak (Anchorage Daily News, July 6, 1985: C-2).

In many ways the base is designed to be a self-sufficient unit. Facilities and services are available to maintain approximately 1,800 personnel (Coast Guard and civilian) and dependents. The only exceptions are housing and schools; the base depends on the surrounding community for these services. When the Coast Guard assumed command in 1972, some aspects of the base were considered substandard. The guard drew up a 10-year development plan to upgrade the base, with emphasis on "people oriented" aspects such as housing. As part of the solution to the housing problem, some dependents (approximately 100 families) are now housed in Kodiak city itself on a "rent plus" basis, which adjusts payments to local economic requirements.

Part of the interaction between the base and the town is the exchange of workers. Though no accurate figure could be obtained, it was estimated that at least half of the Coast Guard wives work, many of them in town at, for example, the hospital and the schools. Conversely, there are many civilian employees who work on the base. In sum, for many reasons the Coast Guard base is an important element in the Kodiak city region. As an example, approximately 20,000 acres of land are under Coast Guard control--the estimated value of this land is $500 million.

LOCAL CUSTOMS

Culturally, Kodiak is distinguished by a number of institutions and annual events that reflect the history and culture of the area. Though there are many religious denominations in the town, the oldest is the Russian Orthodox Church; the Kodiak parish is the oldest in the Orthodox Church in the United States. Orthodox missionaries first arrived in Kodiak on September 24, 1794. The Church has been active ever since. An early missionary has been canonized as St. Herman. In recent years, St. Herman's Theological Seminary has been founded in Kodiak to train Alaska Natives to serve local parishes. Another facility is the Baranof Museum, operated by the Kodiak Historical Society. The building is believed to have been erected in the late 1700s as part of the Russian fur industry in Alaska. The museum has a large collection of Native, Russian, and early American artifacts.

A significant cultural event for Kodiak is the annual performance of the "Cry of the Wild Ram," a play about the founding of the Russian American colony in Alaska. First staged in 1966, it is performed at an outdoor theater each August. Over 400 Kodiak residents participate in the production, which draws an audience from as far away as Anchorage. A group based on Kodiak's historical past are the Kodiak Russian Dancers. Begun in 1973, the group tours Alaska with their performances of traditional Russian dances. In Kodiak they teach dance and folk dancing to local residents as well as performing at civic functions.

The Kodiak Crab Festival is held in May to signal the end of winter and the beginning of summer. Activities at this festival encompass all sorts of sporting events, including a foot race up a 1,400 foot mountain. There are survival suit races, speedboat and kayak races, an art show, two parades, and other similar events. Some local residents have suggested that in view of the current state of the crab industry the name of the festival might be changed, but no official action had been reported as of the summer of 1985. Additional local get-togethers include the Buskin River raft race (where any sort of vessel can participate) and the Kodiak Jaycee Rodeo and State Fair where Kodiak's cattle and agriculture industries as displayed.

SUMMARY

In summary, Kodiak city is a dynamic and industrious community with an economy reflective of its environment and geographical location, and a sociocultural profile reflective of its history, traditions, and economic activities and concerns. It shares many similarities with other Alaskan communities, especially the characteristics of other Gulf of Alaska fishing communities, such as Cordova and Seward. While its infrastructure, institutions, and sociopolitical nature are not different from small American communities, Kodiak possesses a distinctiveness that is reflected in the nature rather than the form of its socioeconomic entities. In the remainder of this chapter Kodiak's uniqueness will be discussed, within the context of the recent decline in the fisheries.

The Fishing Sector

BACKGROUND

Kodiak city has long been a fishing community. The build-up of the fisheries evolved over a lengthy period, and in recent times it was a year-around fishing port. There was summer salmon fishing, followed by a fall king crab harvest. The winter tanner crab industry had developed as had the shrimp industry. In the spring there were the herring and halibut fisheries. On top of all this there was the emerging bottomfish industry.

This buildup was fostered by a number of factors. These included the availability and demand of markets, improved refrigeration, new fishing technologies and techniques, expanded financing and investment opportunities, fishermen's independence from the old "cannery system," and similar causes. Kodiak fishermen knew how to seize the advantage when new opportunities arose. Both they and cannery operators all along had been innovative. Each developed new equipment and/or techniques and was creative in the maintenance of their part of the industry. Because Kodiak was at a distance from the sources of support, resources, and expertise, when a new situation arose fishermen and processors had to solve problems themselves, reinforcing their sense of self-reliance. An excellent example of this innovative spirit was the development of the king crab industry as pioneered by Lowell Wakefield (Blackford 1979).

Kodiak's residents displayed strong social cohesion when confronted by threat or opportunity. The 1912 volcanic eruption and the 1964 Alaska earthquake are examples of threatening events when residents joined together for mutual support. Similarly, when it came to events affecting their livelihood, social cohesiveness emerged. Efforts to enhance marine resources, with all the concomitant political, economic, and labor maneuvers, are examples of positive social cohesion. From the family through cannery and boat crews and unions, to higher forms of government, Kodiak residents are organized to promote their fishing industry.

The factors all led to an extremely successful industry throughout the 1970s and into the early 1980s. Statistics for this period reveal a more than doubling of the average price per pound for king crab between the 1975-1976 and 1976-1977 seasons. A banner year occurred in 1981-1982 with an ex-vessel price of $48.5 million. Even in the 1982-83 season, with a catch less than half the previous year, an increase in the average price per pound from $2.00/pound to $3.75/pound resulted in $32.7 million in ex-vessel earnings. Kodiak was the top port in the nation for value of landings in 1981 and the second highest port for value of landings in 1982. For the average Kodiak city fisherman, this meant a productive and, over these years, an increasing income. As noted in the earlier chapters of this report, the average gross earnings for the Kodiak city fisherman went from lows near $30,000 in 1975 to a high just over $103,000 in 1978; it remained around $90,000 for the next three years and began to decline in 1982.

The favorable economic climate also attracted new residents. In 1975 there were 393 fishermen in the city; by 1981 the number had increased to 802; then it declined to 622 in 1983. Kodiak city also dominated the larger Kodiak-Shumagin region in terms of fishermen, with consistently over 85 percent of the area's fishermen as residents of the city.

DECLINE OF THE KODIAK FISHERY

Beginning in the early 1980s, economic woes came to the local fishing industry. Fluctations have come to Alaskan fisheries before. For example, the halibut industry declined because of overfishing in the 1920s and 1930s. In the 1940s and 1950s the salmon industry experienced a severe setback (Blackford 1979). By 1979 there were already signs there might be some future problems in Kodiak's eclectic fishery, with the shrimp industry experiencing a decline.

If only one resource, such as shrimp, experienced a downturn the void could be filled by the other resources so long as the alternative fisheries remained stable. However, this was not to be the case. The shrimp industry continued to decline in the 1980s with no fishing in 1982, no local fishing in 1983, and a small scale local fishery in 1984. But the biggest setback was with king crab. In 1982 there were high prices but low production in this fishery. Then the king crab fishery was closed in both 1983 and 1984.

The salmon industry did well in 1980 and 1981 and had good numbers but a low price in 1982. The next year was not distinguished with lower prices and number; there were good numbers of fish in 1984 but prices were low.

Tanner crab catches were only fair from 1982 through 1984, although this resource gained in importance as king crab fell off. The dungeness crab industry appears to have peaked in 1982 and started its decline in 1983. The scallop industry is small in Kodiak and has not offset the overall decline. The sea urchin, clam, and prawn fisheries are very small and experimental. The herring fishery is also small, and not able to offset declines in the economically more profitable fisheries.

The bottomfish and halibut industries have received attention lately as alternatives. They were envisioned as picking up the slack with the decline in the other sectors. Although not as economically rewarding as the king crab and salmon fisheries, they would keep the canneries working, provide alternative employment for boats and crewmembers, and keep alive the hopes of fishing families.

EFFECTS OF THE RECENT DECLINE

It is not feasible to describe all of the consequences of the fisheries decline. Later in this chapter we seek to document the ramifications for family life, for alcohol and drug abuse behavior, for crime patterns, and for public assistance and social service agencies. To introduce the detailed discussion, a review of the impacts in the fishing sector is presented initially. Included in this part is a description of the change of attitudes about OCS development. The relation of present concerns to earlier ones is discussed first.

Changes in Earlier Concerns

In the late 1970s, several issues were of concern to Kodiak residents; they were documented in an earlier study (Payne 1980). One that was closely related to the fishing economy had to do with expansion of Kodiak's harbor facilities. This was the Dog Bay/Pillar Mountain issue and it had a direct bearing on the bottomfish industry.

Harbor facilities. The problem centered on the expansion of the fisheries in the 1970s and the inability of the Kodiak boat harbor to accommodate the numbers and increasing lengths of vessels. There were 225 stalls in the harbor in 1978, with 1,251 vessels, both resident and transient, utilizing the facilities that year. The harbor was built to berth vessels with a maximum length of 85 feet. Longer ones were accommodated but they could damage the floats and it was preferred that these vessels moor elsewhere. Throughout the 1970s Kodiak harbor was an increasingly active place and the harbormaster and his crew performed a herculean task in handling such heavy traffic. Vessels would be tied five to seven deep at the end of the floats, and facilities along the Near Island channel were used.

The inevitable result was a call for expanded harbor facilities. Especially with the king crab industry growing and the possibility of bottomfish harvesting looming on the horizon, local entrepreneurs felt that better facilities were needed if these two industries were to develop.

There was also an expected need for more harbor space for pleasure craft and float planes, and for commercial freighter facilities. The solution appeared to be near at hand. Directly across from the Kodiak boat harbor were two excellent locations suited for development. Nestled on the Kodiak city side of Near Island was Dog Bay and on the other side of Near Island was Trident Basin. Of the two it was decided Dog Bay would be the area for expansion and funds were obtained.

Then a problem emerged with Pillar Mountain, which is located near the city on Kodiak Island. Geologists warned that a landslide could occur on Pillar Mountain, which would destroy the road and facilities in its path and potentially create a 10 to 12 foot tidal wave. This would destroy the existing boat harbor and the proposed Dog Bay development. Eventually, this obstacle was overcome and the new facility was built. Renamed the Saint Herman's Boat Harbor, the new port added 300 slips and was viewed as a long needed solution to an extremely pressing problem. At last there was sufficient room and appropriate accommodations for different sized vessels.

Unfortunately, the new harbor has experienced additional problems. Severe winds and tides have plagued the location; structural and vessel damage has resulted. Some hinges and collars have broken, and during one large storm a 140 foot vessel loaded with crab broke loose. Mooring lines chafe from the constant wind and sea action; this threatens to free more vessels. Finally, there were some technical problems with the construction of the pedestrian ramps. Several steps have been taken, or are planned, to solve these problems. One of the first was to bar any vessel over 120 feet in length from using the facility. Specific structural problems have been either repaired or replaced. The biggest need, it has become obvious, is for construction of an armorrock breakwater to curtail the effects of tides. This was considered a high priority by the city and the borough in their capital improvement projects for FY 1985. Completion of the breakwater should stem the displacement problems the harbor has been experiencing.

One further irony stems from the downturn in the fisheries sector of the economy. After all the years of overcrowding, there are now vacancies in the boat harbor. Many of the open slips are used for transient vessel moorage, but even this usage is down in numbers. Though it is advantageous to have some extra space, any unused space means reduced revenues. Some fishermen have experienced difficulty paying their stall fees. Payments are being made at a slower then normal pace, and in some cases the due dates have been rearranged or extended. The lack of activity and need to cut costs has also affected the number of personnel at the new site. Positions for three harbor patrol officers have been cut out, reducing the staff to eight officers. At the same time, the slowdown has made life easier. According to the harbormaster, administering the boat harbor during the peak years demanded a hectic pace with a high level of activity; "It was 13 years of 365, 24 hour days. Now the activity has slowed to a snail's pace."

Processing Facilities. Another concern in Kodiak in the 1970s and early 1980s was the Unification Church and the development in Kodiak of International Seafoods. International Seafoods is an Alaskan subsidiary of International Ocean Enterprises, which is a corporation established by the Unification Church of Rev. Sun Myung Moon. The members of this church are sometimes disparagingly referred to as "moonies." Rev. Moon's church gained notoriety when it was charged with brainwashing new members, and some parents of members kidnapped their children and had them "deprogrammed." The church has been investigated by a congressional subcommittee and the Rev. Moon, convicted of income tax irregularities, served a sentence in federal prison.

The establishment of the International Seafoods in Kodiak raised concern among some community members about their children's safety. Articles about the church appeared in local newspapers and the Kodiak Rotary Club had an ex-member speak of his experiences in the church and about his subsequent deprogramming. The church and International Seafoods were a "hot topic" in Kodiak for quite some time.

Now the concern appears to have dissipated. The International Seafoods plant is not currently operating. In the fall of 1985, a series of articles about the Church appeared in the Kadiak Times. The paper noted that, "Whether. . . any of the fears expressed so vocally six years ago were justified remains an unanswered question" (Kadiak Times, September 12, 1985:1). International Seafoods also purchased Pacific Pearl, another fish cannery, but it is vacant, with its facilities being used as a dock. Pacific Pearl processed salmon in the summer of 1984 and there exists the possibility they may process herring in the future. But like the other land based processors in Kodiak, they too have been affected by the overall decline in the fishing economy.

Current Concerns

The earlier concerns just reviewed have been overshadowed by the more pressing, immediate matters stemming from the fishery contraction. One graphic and depressing symbol of the downturn has been the repossession of boats by creditors for failure of their owners/purchasers to make payments.

Repossession of vessels. This action is one of the first topics individuals bring up when asked about the effects of the downturn. Accurate statistics on repossessions are almost impossible to obtain because of the different agencies who are the creditors, their methods of repossession, and the varying home ports of the vessels. However, the harbormaster could isolate at least 15 vessels that were repossessed in 1983-1984, and most knowledgeable people estimate that upwards of 25 have since been repossessed, especially in 1984. Individuals close to the fishing scene in Kodiak city believe that more repossessions are yet to come. There is even some gallows humor associated with the situation. As one individual recounted, "The banks in Seattle ran out of toasters, so they're giving away Bering Sea king crab boats with every new account."

King crab boats are, as a matter of fact, good illustrations of some of the difficulties Kodiak/Shumagin fishermen are facing. The problem with the large king crab boats, according to those familiar with the fishery, is that there were too many of them, they were too efficient, and they were purchased at an inopportune time. Distinct changes in vessel characteristics came about between 1960 and 1980. These changes were fairly uniform throughout the crabbing fleet, though there existed some small variations. In general, the actual numbers of vessels registered per area increased, in some cases dramatically. For example, the vessels in the Kodiak king crab fishery more than doubled. But even more impressive was the Alaska Peninsula tanner crab and the Bering Sea crab vessels over 50 feet in length whose number was five times greater in 1980 than in 1969.

Although the numbers grew larger, the length, breadth, depth and tonnage of the vessels in these fisheries remained the same or increased slightly during the period. The fleets became younger as the average age of the vessels declined. In all but one of the fisheries, average horsepower of the vessels increased and in one it increased dramatically. In the smaller vessels (under 50 feet in length) there was a uniform conversion from wood hulls to fiberglass hulls. In the larger vessels (over 50 feet in length) there was a uniform conversion from wood hulls to steel hulls. In other words, there was a significant increase in the numbers of vessels participating in these fisheries along with a trend of modernization of the vessels themselves (Alaska Commercial Fisheries Entry Commission, 1982). These changes came about when successful fishermen and investors sought ways of investing profits, upgrading their boats' efficiency, and reaping even larger returns from the flourishing fishery.

The difficulties began when the fishery closed. Creditors still required their payments, but many of the boatowners found themselves unemployed, their large crab boats idle. Not only did the owners have to make the basic boat payments, but they also faced insurance and fuel payments. Their non-working boats became the source of rapidly increasing debts. Yet another complication arose because, with the fishery closed and the boats idle, the vessels' value dropped markedly, if an owner could find a buyer. For example, a $1 million boat was worth only a quarter of that price. So even if an owner found a buyer, one wouldn't recapture the investment nor pay off the debt. As one crab fisherman said, "You can't make money with it, you can't get rid of it, and you can't sell it or give it back." Though some of the vessels have been repossessed, most have not because banks generally try to avoid taking physical possession of collateral. A fishing boat does not benefit a bank if it is not being used productively. Furthermore, banks are not more likely than the owners to find new purchasers.

Insurance is expensive for these vessels and they are usually underinsured so that even if they are accidentally lost at sea, the owner would be unlikely to recapture his investment. This fact has served to prevent any tendency on the part of desperate fishermen to scuttle their vessels for the insurance. For their part, to assure this won't happen, the insurance companies have been dropping coverage of the vessels. For example, one well known and well respected fisherman had his insurance cancelled, without explanation, the same morning he was contacted for this report. While insurance prices in general are increasing across the nation, and particularly in Alaska, large vessel insurance is becoming so difficult to acquire that it may reach the point of being almost unobtainable (Anchorage Daily News, May 2, 1985:A-1,A-16).

Deckhands. A particular group that has suffered economically from the decline in the fishing industry is the deckhands. While these individuals do not have the responsibilities and payments that vessel owners have, they also do not have the resources nor the support systems to deal with prolonged financial hardship. Because of this they are more likely than vessel owners to leave a vessel, a specific fishery, and a fishing occupation. Such shifts can create pressures on the deckhand and the deckhand's family (for those who have families) and such disruption also depresses the deckhand's chances of upward mobility in the profession, for those with the ultimate goal of being vessel owners.

It is not just the deckhand and family, however, who may be disadvantaged. A boat's entire operation can be disrupted. Every vessel owner desires to have a well-trained, socially compatible crew who seasonally or consistently (depending on the fishery) work on the boat. This relationship promotes efficiency, higher profits, and safety. With the economic decline in Kodiak, many of these relationships have been lost. Some vessel owners are now faced with hiring inexperienced and/or unreliable crewmembers, and there has been a concomitant decrease in safety and profits.

Safety. Another current concern is for the safety of fishermen. As diversification introduces new activities, safety becomes more important; bottomfishing, for example, can require vessels to be at sea for 10 to 11 months. The Coast Guard, as the agency responsible for search and rescue, has been busy; Tables 256 and 257 reflect activities in recent years. As indicated, there were 1,058 accident or casualty cases involving fishing vessels in the Pacific Northwest between 1981 and 1985.

Note that, for Coast Guard report purposes, accidents occur to people whereas casualties occur to vessels. In the 1,058 total incidents 136 deaths and 70 injuries were included. It is estimated by the Coast Guard that the "70 injuries" figure is conservative, since there were probably many cases of injuries that went unreported. Of the totals, 27 accidents involved vessels 85 feet or greater in length; included were 11 deaths and 16 injuries. For casualties involving vessels of the same size or greater for this same area, there were 82 cases resulting in 31 deaths and 4 injuries (U.S. Coast Guard file data).

More specific to Kodiak, the data from Table 257 shows there were 229 search and rescue cases involving fishing vessels between 1979 and 1983. Thirty lives were lost, 194 lives saved, and 618 were cases where the Coast Guard provided assistance. Also noted on this table is the high value of the property (U.S. Coast Guard file data).

TABLE 256

PACIFIC NORTHWEST[1] REPORTED FISHING VESSEL CASUALTY AND ACCIDENT STATISTICS: 1981-1985

	CASUALTIES[3,5]			ACCIDENTS[4]			COMBINED TOTALS PER YEAR		
Year[2]	No.	No. of Deaths	No. of Injuries	No.	No. of Deaths	No. of Injuries	Total No.	No. of Deaths	No. of Injuries
1981	352	35	5	23	8	15	375	43	20
1982	224	12	2	35	17	18	259	29	20
1983	269	44	5	19	7	12	288	51	17
1984	117	11	4	11	2	9	128	13	13
1985	11	--	--	--	--	--	11	--	--
Totals 1981-1985	970	102	16	88	34	54	1,058	136	70

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[1] Refers to 13th and 17th District waters.
[2] Data is imcomplete for 1984 and 1985.
[3] Casualties occur to vesssls.
[4] Accidents occur to people.
[5] 285 vessels lost.

Cultural Dynamics

SOURCE: U.S. Coast Guard file data.

At present the Coast Guard in Kodiak has six C-130 aircraft, four H-3 twin engine helicopters, and three H-52 single engine helicopters available for search and rescue (search and rescue are not the primary mission for the H-52s but they can be used for such operations). In addition, there are two medium endurance Coast Guard enforcement cutters (The Yocona and the Storis) and two buoy tenders (the Firebush and the Ironwood) located in Kodiak that are also used for search and rescue, though this is not their primary mission. In terms of expansion in search and rescue, the Coast Guard is presently looking at establishing a small detachment at Cold Bay. Changes in fishing patterns can place new demands on these services. For instance, a large scale bottomfish effort would probably increase the number of Coast Guard assistance cases. More vessels and more time at sea would additionally mean more lives and property lost, including the chance of Coast Guard mishap because of their increased activity.

TABLE 257

Fishing Vessel Search and Rescue Cases,
Kodiak and Bristol Bay Areas: 1979-1983[1]

		LIVES			PROPERTY	
Year	Cases	Lost	Saved	Assisted	Assisted	Lost
1979	50	5	23	147	$7,582,000	$1,640,000
1980	53	4	28	116	3,149,000	934,000
1981	43	0	18	119	3,561,000	4,360,000
1982	38	10	8	156	6,128,000	2,408,000
1983	45	11	117	80	2,690,000	2,325,000
Totals	229	30	194	618	$23,110,000	$11,667,000

[1] Area bounded by 54N to 59N and 150W to 162W

SOURCE: U.S. Coast Guard file data.

Cultural Dynamics 1986

RESPONSES TO THE DECLINE: HARVESTING SECTOR

Diversification

In response to the economic pressures, many crab boat owner/operators are seeking to diversify their operations. Some have used their vessels as tenders for the salmon fisheries. But there is only room for a certain number of tenders and not necessarily a need for larger ones. Also, the erratic salmon seasons in Kodiak do not promote mass utilization of these large vessels. Tendering for OCS operations was another possibility, but the need for such services in Shelikof Strait for the exploratory operations there turned out to be minimal.

Another alternative, which at first thought seems appealing, is the use of large crab boats for bottomfishing. The developing bottom fishery initially appeared the most likely disposition for these vessels since their size and design suited them for this alternative. However, there are problems in converting from crabbing to bottomfishing. One is the actual structural conversion of the boat into a bottomfishing vessel. To start, there is the expense of conversion. For example, it cost $570,000 to convert two boats in Kodiak from shrimp operations to bottomfish. The conversion from a large crab vessel to bottomfish operations is estimated to cost as much as $750,000. Next, there are complications involving safety. Some conversions introduce stability risks. If a skipper chooses to weld on his trawl gear and then goes back to crabbing with the same number of pots as used prior to the conversion, he increases the chances of flipping the vessel. Bottomfishing components that can be bolted down instead of welded are safer but unfortunately more expensive. The bolted components can be removed prior to converting back to crabbing, according to naval architects (Alaska Fisherman's Journal, Nov. 1984: 8-10). Lack of awareness of these risks has already led to some accidents.

After the initial investment, maintenance and replacement costs are demanding. Bottomfishing can require being at sea for 10 to 11 months. This means more wear and tear on the gear from working in rougher weather on rougher grounds for longer periods. The probability of more gear loss is increased. Fishing for 4-1/2 cents per pound for bottomfish as opposed to $4.50/pound for crab means much more work if an investment is to break even, let alone pay off.

Joint Ventures. A new aspect of diversification is the introduction of joint ventures for bottomfishing. Many of these efforts involve parties from two nations. In previous years most bottomfishing was conducted by foreign fleets. However, two factors are working to force increasing U.S. participation in this market. First was the passage of the Fishery Conservation and Management Act of 1976 (FCMA). By extending federal jurisdiction out to 200 miles, foreign vessels are no longer allowed to fish freely as they once were able to do. At the same time, the FCMA states that an optimum yield of fish are to be captured each year. Thus, if U.S. fleets do not take the allowed poundage, then foreign fleets have a right to do so (Public Law 94-265, 1976). The second factor was the decline in the crab and shrimp fisheries. Because of this downturn, U.S. fishermen began seriously looking at bottomfishing as an alternative. However, rapid involvement in a new fishery, especially one as unfamiliar as high seas bottomfishing, is not an easy process. Neither the infrastructure nor the experience were available for a rapid switchover.

This state of affairs made cooperation with foreign entrepreneurs look attractive. Arrangements that emerged early in the process were joint ventures where foreign "mothership" vessels processed the fish caught by

American catcher boats. In federal waters, nations participating in such joint ventures include Republic of China (Taiwan), Japan, Korea, Germany, Portugal, Poland, and Spain. The majority of the catcher vessels are non-Alaskan. By way of illustration, in 1985 a west coast fleet (made up primarily of boats from Oregon) was scheduled to fish the Bering Sea in a joint venture with Russian processing vessels. The fleet was to catch flounder for shipment to the Soviet Union, with the season estimated from April through September. Fishing was to occur for 24 hours per day with crew relays planned to provide time at home for U.S. workers (Anchorage Daily News, March 11, 1985:B-10).

In state of Alaska waters (within three miles) joint ventures have included Republic of China, Portugese and Spanish vessels as the processors, with Alaskan catcher boats. A problem with this arrangement is that, though it has helped some fishermen, the shore-based processing facilities in Kodiak city have not been greatly assisted. Another attempt uses catcher/processor combination vessels that perform both tasks. Again, the arrangement does not benefit shore-based processing facilities. According to some industry observers, the catcher/processor vessels appear to provide the most viable future for the industry and are the only sector where capital investments are being made.

One contemporary concern expressed by local fishermen is how to enter into an advantageous joint venture. According to some observers, the process is "really cut throat, and depends on vessel capacity, who you know, your reputation, how much you will fish for, and how quickly you'll sign the contract." Because of this, a new group of entrepreneurs appears to be emerging who are skilled at putting together joint ventures. These individuals have worked in the fishing industry long enough that they have established working and personal relationships with representatives of foreign fishing industries and they know local fishermen. In their new role, they are serving as middlemen who are able to connect the processor and the catcher to help form a single operation.

In summary, the potential of harvesting bottomfish as an adaptation by the fishermen to the decline of crab and shrimp appears to have potential long range benefits, but several problems have been experienced in the initial phase-in period. These include financing, vessel conversion, gear acquisition, education and training, linking up and contracting with joint venture partners, and the associated social effects of a new fishing pattern that involves more time at sea.

The Halibut Fishery

In the view of many Kodiak fishermen and observers of the industry, the availability of halibut has been a life-saver for both fishermen and the industry as a whole. In recent years many Kodiak fishermen have begun to participate with good success in the harvest of this fish. As already noted, the halibut industry experienced a decline in the 1920s and 1930s, but rebounded over the next three decades until the 1960s. Then it again began to decline, reaching a marked low in the 1970s (International Pacific

Halibut Commission 1978:24-25). Part of the recent downturn is attributed to foreign dragging fleets, which took large catches of halibut in the 1960s and 1970s (Kodiak Daily Mirror, Nov. 30, 1984:1).

Kodiak city was of minor importance as a halibut landing port until the 1960s, but by 1970 it was the second largest receiver of United States caught halibut on the west coast. Part of the town's emergence as a halibut landing port was the growth of the crab and shrimp fisheries that allowed for the development of facilities big enough to accommodate a large volume of halibut (Bell 1981:90). In the late 1970s and into the 1980s halibut stocks again rebounded to a viable level. The fact that the stocks, and subsequent fishing allocations, increased during this period when shrimp and crab stocks were declining is viewed as direct relief for the local fishermen.

Improvements in the techniques of the fishermen have accompanied the growth in the number of fish. Much of the improvement has come in catching efficiency with the introduction of better technology. The traditional catching technique involved the use of an offset hook shaped like a "J," familiar as the common fishhook used for most rod and reel sport fishing. However, in the last few years a new hook has been adopted for halibut. Called a "circle" hook, it is rounder and has an extra quarter turn at the tip. This modification makes it from two to two and a half times more effective. Another way halibut fishermen are using technology to improve their efficiency is by employing loran to locate their gear and to chart accurate return paths to productive fishing locations.

The increased success in the halibut fishery has not been without concerns and problems. Though the specific allocations have been increasing for the last few years, some fishermen feel that they should be even larger. Several factors spur this belief. First of all, the productivity of the catch has led to an impression that the biomass is much larger than the regulatory agency will acknowledge. Second, there is a belief among some fishermen that halibut prey upon king crab. The decline in the king crab stocks happening at the same time as the increase in the halibut stocks fuels this belief, despite assertions by biologists that halibut do not feed on king crab (Kodiak Daily Mirror, Nov. 30, 1984:3). Given these attitudes on the part of the fishermen, it makes sense that they would favor increased harvesting of halibut in the hopes of eventually increasing king crab stocks. Combining these two points, with the slow-down in the fisheries economy, some fishermen conclude that increased halibut fishing would take advantage of the underestimated stocks and improve the king crab fishery.

Another problem in the halibut fishery is the way market forces impinge on individuals. Profit-oriented fishermen wish for increasing allocations so they will individually be able to catch more fish, which translates into more profit. The complication is that when landings increase, fish are plentiful and prices drop. In effect, the fishermen work harder to maintain the same economic level as if stocks were scarcer and prices were up. Yet another problem is quality. With large landings and the participation of inexperienced fishermen in the harvest, there have been some quality problems. Fishermen, processors, and the regulatory agencies are all concerned, since any publicity regarding "bad fish" could reduce prices. Therefore, all are working toward improving the quality of the catch.

The separation of the agency responsible for halibut management from other fisheries management groups concerns some fishermen. Biological management of halibut rests with the International Pacific Halibut Commission composed of Canadian and U.S. representatives. Management of seasons, gear, etc., has been the responsibility of the North Pacific Fishery Management Council since 1982. The feeling on the part of some is that if the fishery were managed by the state of Alaska through the Alaska Department of Fish and Game, it could be coordinated with the other fisheries and thus be more productive. These proponents contend the Alaska Department of Fish and Game would be closer biologically to the fishery and the fishermen could have more input into decisions regarding it.

A large concern is the incidental catch of halibut. The incidental catch are those fish caught in the process of harvesting other species; in other words, the halibut caught are not the fish targeted for capture, but are incidentally obtained. To the fishermen who are specifically after halibut, any stocks taken incidentally decreases their potential take. This is because the maximum sustained yield is computed by adding the incidental catch to the directed catch. Efforts are underway to decrease the incidental catch through management.

Perhaps the most significant and potentially contentious topic surrounding the halibut fishery is the question of limited entry. Its introduction would create a situation similar to the salmon and herring fisheries where only fishermen with permits are allowed to harvest those species. In the fall of 1984, when the research for this report was being done, Kodiak fishermen appeared to be generally opposed to halibut becoming a limited entry fishery. The main reason for their opposition is the restriction that limited entry places on a fisherman's ability to diversify. This ability is especially critical when there is a decline in other species. For example, if halibut had been a limited entry fishery during the last few years when shrimp and crab declined, fishermen would not have been able to switch. These local fishermen are adamant about keeping halibut an unlimited fishery and are willing to take political action to support their point of view. They would like to guarantee flexibility in their fishing strategy so they can take advantage of new opportunities by avoiding species limitations.

Additional Responses

Besides diversification, other adaptations have occurred in response to the economic decline. Some Kodiak fishermen have left Alaska for other waters. A few are fishing in Hawaii for deep ocean shrimp. Two have gone to waters off Florida to fish for crab. Some fishermen are investigating the potential of the crab harvest off South America. Some who stayed in Kodiak are trying to develop a charter business by using their vessels to transport sport hunting and fishing clients. Still others have dropped out of fishing altogether. A variation of this occurs when fishermen temporarily change jobs, with the intent of reentering fishing as soon as an opportunity arises. These fishermen have taken other work such as driving cabs, carpentry (some with the current refurbishing of the Coast Guard base), and other jobs for which they possess skills. It is impossible to determine the number of individuals who have selected to change occupations.

Summation

Many Kodiak fishermen have suffered from the recent downturn in the fishing economy. The setbacks have affected not only their economic and professional lives, but also their family lives and crewmember relationships. The previously accepted ideology of an ever expanding, dynamic fishery with substantial economic opportunities has been shaken. This is particularly true of the younger fishermen and their families who entered the fishery during the expansion of the late 1970s and early 1980s. Older fishermen have a longer perspective that incorporates previous down periods. However, in true Kodiak fashion, the populace is reacting in adaptive fashion. Characteristics that make for successful fishing (e.g., aggressiveness, innovation) are being activated. Making the adjustments is not without difficulty. Entering joint ventures or switching to the halibut fishery illustrate the problems of diversifying. But it appears that these obstacles can be overcome and that Kodiak fishermen will survive, even though it may be in a changed, and probably leaner, fishery. If the response to past downturns is any guide, the current crisis will successfully be overcome.

RESPONSE TO THE DECLINE: PROCESSING SECTOR

The land-based processors in Kodiak were hard hit by the declines of the early 1980s. As one processor put it, "About 70 percent of the industry is just maintaining, just surviving. The industry has nowhere to go but up." Shortcomings in marketing strategies and foreign competition are perceived as combining with the lower number of fish to hinder the industry. Like the fishermen, this sector is also attempting to adapt to changing conditions.

Diversification

No longer are the Kodiak canneries exclusively (or almost exclusively) oriented to salmon and crab processing. Most have diversified and now are capabls of processing several species. Thus they are able to take advantage of many of the resources as they are harvested. The feeling of management is that with the current extremely competitive market the facilities must be flexible in order to survive economically.

One new industry with growth potential is surimi production. Surimi--a high protein, odorless fish paste--can be used as a protein food supplement or made into such items as artificial crab. The Alaska Pacific Seafood company of Kodiak received a grant from the Alaska Fisheries Development Foundation to experiment and develop surimi using pollock (Anchorage Daily News, March 13, 1985:C-6). Two other surimi operations were being planned. Both are joint ventures between Japanese and U.S. interests; one was planned for Dutch Harbor and the other for an undisclosed location (Anchorage Daily News, June 28, 1985:D-4). Because surimi production is so new a venture in Kodiak city, it is too early to predict how large a part it will play in the overall diversification strategies of the different processors.

In addition to surimi production, several processors have attempted to utilize bottomfish. The enterprise has encountered problems. For example, in the spring of 1984 there were nine plants filleting codfish. All was going well with $1.25 to $1.30 a pound being received, until the Canadians dumped millions of pounds on the market at $1.00/pound. This immediately undercut the Kodiak effort. Another problem is competing with the floating joint venture operations; shore-based processors must obtain a high enough price to cover the cost of operations and make a profit. Finally, there is the problem of acquiring a large enough and consistent supply of fish.

The bottomfish industry in Kodiak is viewed by some as a "fill-in" fishery to augment the traditional processed species; for example, when not processing salmon you "fill-in" with bottomfish. However, from the fish buyers' perspective there must be a consistent amount of poundage guaranteed before they are willing to sign contracts. As such, the fish buyers are looking for a strong industry commitment to bottomfish from the Kodiak processors. These differing perspectives contribute to the problems the industry must overcome in order for bottomfish to become a viable industry.

Fishermen also must wrestle with the problems of supply. According to knowledgeable observers, fishermen are more than willing to harvest bottomfish provided the canneries are willing to agree to buy a specific quantity at what the fishermen consider acceptable prices. But many fishermen feel the processors are as yet uncommitted to the bottomfish industry. Conversely, some of the canneries feel that it is not in their best interests to pursue bottomfish because the fishermen will leave for any other cannery or floating processor who offers them a few cents more per pound. Thus there is hesitation on both sides, with the buyers demanding firm commitments. The hurdle will most likely be overcome as the industry edges more firmly into bottomfishing and contracting procedures are worked out.

Another problem for the bottomfish operators is having a trained crew of filleters. Filleting is a skill that requires special training, unlike handling other species which requires less extensive training. Apparently a large number of trained filleters exists both on Kodiak and on the west coast. Many of the latter are unemployed and are ready for work. The problem is that the processors must assure enough steady work before the west coast filleters will move to Kodiak. Enough steady work is also a concern to the local cannery workers. To run a year-around efficient, successful operation it is mandatory that a processing plant have a crew trained in all the different operations specific to the different species. From the cannery workers' perspective, however, they cannot remain in Kodiak waiting for possible jobs.

A few of the processors have purchased filleting machines. There are, however, certain difficulties inherent in a machine approach to filleting. First of all, machines involve complicated technology that requires a high initial investment. For illustration, it is estimated that, in order to break even financially, 20,000 pounds of fish must be processed per day. Anything under 20,000 will be run on a hand filleting line if a processor has both a hand and a mechanized line. Even with the "break even" point at 20,000 pounds there is a degree of hesitancy to process amounts at or somewhat above this figure. Profit margins are so narrow that an acceptable and reasonable profit level requires a run of 40,000 pounds per day. To reach this level, a consistent supply of fish is needed, a problem already discussed.

In today's competitive world market the final product must be of high quality. To produce a high quality output, time must be invested so experience can be gained. It is recommended by those familiar with the machine approach to filleting that the processors initially begin with a hand fillet line and then add machines as they gain experience in processing bottomfish. It is also noted that the machines are excellent for processing mid-range size fish, but bigger or smaller ones need to be hand filleted in order to assure quality. This suggests a need for hand filleters even when machines are used.

The Labor Force

The processors have attempted to keep their trained labor force in Kodiak. The goal during the highly productive period was to have a year-around industry, and during this time an increasing number of cannery workers did establish residency in Kodiak.

The problem now faced by the processors is how to keep their "core" group of workers employed. A core group is a unit (15 to 20 or so workers) that has been trained in all facets of yearly cannery operations and serves as the backbone of operations. They are supplemented by additional local employees during the summer and by a larger transient force during the summer salmon season. One change that has occurred in recent years is that the canneries no longer need to import crews as they did in earlier years. The core group is now augmented by a flow of applicants who come to Kodiak each summer in search of high paying jobs, or as one observer put it, "They just show up!" The trend began during the "boom" years when there was an ever increasing need for workers; word spread of the high paying jobs in Kodiak and relatively inexpensive flights made mobility to Kodiak easier than in previous times.

From a processor's point of view, the ideal arrangement is to have a crew that is just large enough to handle whatever species arrives at a cannery. A perfect core group would be trained to handle the various bottomfish species, crab, shrimp, salmon, and herring. With the economic incentive of diversification, the processors need a core group like this to survive. From a cannery worker's perspective, however, an individual cannot remain in Kodiak unless there is employment. With the 1982-84 downturn, an exodus of these workers took place; many who left had been living in Kodiak for most of the year. According to local sources familiar with the situation, almost all of the Vietnamese and Koreans and at least 40 percent of the Filipinos have moved out of the town. One long-time Kodiak cannery hand noted that in 1983 and 1984 workers were lucky to get four months of employment, whereas during the bountiful years they were working 11 months, sometimes 10 to 12 hours per day.

Among the Filipino cannery workers who have stayed, the recent closure of some processing facilities has increased their feelings of uncertainty about employment in the fishing industry. As a consequence, some have sought to take advantage of other economic opportunities. For example, one Filipino will soon join the Kodiak Police Force. Others have taken jobs with the City of Kodiak, in retail stores, and with the borough. As with the fishermen and the processors, through this strategy these residents hope to diversify their economic options.

The decline in the fisheries has had an effect on union membership among the cannery workers. As noted in Table 258 the number of members in the Alaska Fishermen's Union has declined in the last decade. This Seattle-based group is the strongest union in Kodiak for cannery workers and tendermen. During the boom there was a major attempt by unions other than the Alaska Fishermen's Union to organize all the processing workers in Kodiak. The effort was voted down by the cannery employees. According to

TABLE 258

Kodiak Area Cannery Workers and Tendermen
Membership in Alaska Fishermen's Union: 1975-1984

Year	Cannery Workers	Tendermen[1]
1975	61	190
1976	579	112
1977	534	105
1978	570	156
1979	366	123
1980	420	137
1981	398	113
1982	206	93
1983	142	88
1984	199	78

[1] Tendermen figures are estimates only.

SOURCE: Alaska Fishermen's Union file data.

observers familiar with the situation, one reason for the negative vote was the very success of the industry at that time. With so much work, such good wages, and a faith that the industry would continue on an upward path, why unionize? Interestingly, and perhaps ironically, now with poor economic conditions, there is still little interest in unionizing. Only one cannery was completely unionized in 1985.

One final aspect of the altered conditions in Kodiak is the changing relations between the processors. According to some long-time observers of the industry, relations have become more competitive and impersonal. Though always involving some rivalry, the decline in the market along with the strains and newness of diversification have sharpened the contest. For example, in the 1970s there was cooperation between the processors even though they were operating in a competitive mode. As one of the processors stated at that time, "We trade people, machinery, and boats" (Payne 1980: 64), indicating a cooperative spirit and an understanding that they relied on each other to keep their plants in operation.

By 1985 this kind of spirit and interaction seemed to be missing. "We don't sell ice or bait to each other. We barely talk to each other and won't share the product." Several years ago there existed a "Processor's party" and a Christmas party for the processors, both of which have been discontinued. According to one individual, there is a new breed of operator and, "You have to be hurtin' real bad before you request aid" from other processors. Parts for defective machinery can still be obtained from another cannery, but it is much more difficult than in past years. One processor summed it up by saying, "It's just not the same as five to ten years ago!"

SUMMARY

The 1980s decline in the Kodiak fishing industry created ripples of change throughout the fishing economy, and affected the economic and sociocultural patterns of participants in that industry. The fishermen, the processors, and the cannery workers were all attempting to adapt to the altered situation. Diversification into other fisheries is one alternative. This response, along with its potential benefits, has brought new difficulties.

Among the strategies adopted by fishermen are leaving Kodiak; fishing in waters outside Kodiak, Alaska, or the United States; dropping fishing as an occupation, either temporarily or permanently; and searching for other types of work. During the more lucrative years, certain social and economic relationships were established among all members of the fishing industry. Simply put, there were certain ways you did things, certain ways you interacted with other people, and certain things you believed in. These are the patterns that have changed most since the decline of the fisheries.

"The bell doesn't ring any more in Kodiak," is a symbolic statement of the changes that have occurred in Kodiak city in the last five years. "Ringing the bell" is an expression that refers to buying a round of drinks for all patrons in a bar. In many bars there is a ship's bell which can be rung by either a patron, or the bartender, signaling a free round. For many, "ringing the bell" stands for prosperity; when the bell is rung, the economy is strong. In the 1970s the bell was often sounded; observers will recount how fishermen bought their friends one or more rounds of drinks. It was common for friends, or competing boat crews to "six pack" each other (buy six beers), or on some occasions even "case" (24 beers) each other.

When the king crab industry was at its peak, rumors circulated about crew members who made $90,000 for a 9 percent crew share on a boat that worked for only a few months. Another story was about high school students who were the children of fishing families; they were said to carry $400 in cash and, when asked if they would be attending college, replied, "You want me to go to college! What for?" Gold nugget jewelry was a common symbol of success, as were trips and expensive vehicles. In its most overt expression, this prosperity translated into "if you wanted it, you bought it." Certainly not everyone was becoming rich, but the fishing industry was running in high gear during the boom years of the 1970s and early 1980s.

Life was more sober among the fishing families of Kodiak in 1984-85. Some were faced with loss of their vessels; many were seeking employment in areas outside fishing. But it seems likely that the problems will be overcome and the Kodiak fishermen will survive and prosper in a changed, although somewhat leaner, fishery. Kodiak and the fishery have experienced severe impacts in the past. If the response to those historical impacts is any guide, this current crisis will also be successfully overcome.

Attitudes Towards OCS Development

EARLIER ATTITUDES

No single issue in the late 1970s could evoke so strong an opinion from Kodiak fishermen as OCS. The initials were, and are, symbols referring to petroleum exploration and development in the outer continental shelf in both the area adjacent to Kodiak in the Gulf of Alaska and in Shelikof Strait. Three major aspects of ocean-based oil and gas activities disturbed Kodiak fishermen in the late 1970s. First was set of fears about the direct effects OCS development might have on fishing. Second were concerns about what oil and gas activities might do to the community of Kodiak. And finally were suspicions that the petroleum industry and the government agencies overseeing it were less than open and above board when dealing with local residents. Each of these three major concerns will be described.

First were fears that OCS activity would directly disturb fish stocks and fishing operations. Among the apprehensions were that oil spills and/or well blowouts would kill marine resources either directly, or indirectly through degrading the marine environment. Drilling operations were thought to be potential contaminators of the stocks. There were fears fishing gear would be lost or destroyed; crab pot buoys and lines might be run over by support barges; underwater OCS pipe lines would hinder fish dragging operations. Increased traffic at sea would raise the chances of collisions.

There were also worries that OCS activities would compete with and possibly preempt facilities and services used by the fishing industry. Harbor space in Kodiak in the 1970s was barely sufficient to accommodate the existing fishing fleet (Alaska Consultants 1979: 468). The fish processing industry is heavily dependent on fresh water and electricity for its operations, and there was concern OCS would compete for these utilities. Some worried about a loss of flat land that is required for crab pot and other fishing equipment storage.

Some fishing interests felt there were not sufficient economic arguments in favor of OCS development. The fishing industry was in high production and any economic advantages of OCS were believed to be outweighed by its possible deficits. The argument stated: why jeopardize a successful, proven industry for the unknown benefits of an unproven industry? This was buttressed by pointing out that OCS might be substituting a renewable resource (fish) with the development of a non-renewable one (petroleum). There were additional misgivings such as a belief that there wouldn't be sufficient labor for both industries, or that oil and gas would pay more and drive wages beyond what the fishing industry could pay. Finally, there was a fear that the Coast Guard would be too busy with OCS-related activities to continue to provide services to the fishermen.

The second major concern about OCS development was the anticipated effect it might have on the community. Kodiak residents were worried about the difference in lifestyles between Alaskan fishermen and lower-48 oil workers. Some residents wondered whether oil workers would integrate socially; others worried about the number of individuals coming into Kodiak looking for work. They feared the small town atmosphere would diminish and be replaced by the impersonal one of larger cities. Part of the concern was with the power that was believed to come with the money associated with OCS development. Residents foresaw competition for freight services. Some wondered if local services and supplies would be monopolized by the oil companies through their ability to command the highest purchasing price. There was a fear of higher taxes resulting from increased population and increased demand for community services. Housing was scarce in those years, and it was felt OCS money could also monopolize that market.

The third aspect of Kodiak's apprehension about OCS was a perception that the parties involved in oil and gas leasing were less than frank about the process. This perception was based in part on the way in which Lease Sale Number 60 was announced. Titled a "Cook Inlet" sale, people in Kodiak were startled to learn that parts of the offering extended into Shelikof Strait. Shelikof Strait is seen by fishermen as an important economic area. It is critical breeding and nursery area for bottomfish and a harvesting area for other commercial species. At that time, in the late 1970s, the bottomfish industry was viewed as an endeavor that might consolidate Kodiak's seasonal fishing economy into a year-around one. Also, at this time, it offered an alternative to shrimp fishermen whose own industry had been in decline for several years. Any potential destruction resulting from OCS activity was seen as a threat to the emerging bottomfishing industry.

These three major concerns characterized the Kodiak fishermen's attitudes in the latter part of the 1970s. Kodiak residents understood, however, that they could not stop the lease sales, so they decided to work with OCS and governmental representatives in planning for development, in order to minimize any potential conflicts. Many residents felt the best way to avoid problems was to be organized and plan for development.

Changing Attitudes in the Early 1980s

The situation in the late 1970s and very early 1980s was one of firm resistance by Kodiak fishermen to rapid OCS activity, while adopting a stance of willingness to talk and cooperate for eventual, planned development. The fishing industry was robust in those years and the fishermen were powerful enough politically to maintain this stance as the leading position for Kodiak.

In March 1976 an Outer Continental Shelf Advisory Board Council (OCS Task Force) was created by the Kodiak Island Borough government. Its functions were to oversee and monitor OCS activities in the Kodiak area. Residents were kept informed about these activities by a regular series of stories in a special section of a local newspaper. Fisheries and oil company representatives held a series of meetings to develop and improve communications as well as work on mutual problems. This organized approach proved practical and obtained good results. In September 1981, Chevron successfully bid on 13 tracts in the lower Cook Inlet/Shelikof Strait area. Representatives of Chevron came to Kodiak and met with residents to explain their plans, and to reassure them that they wished to maintain a "good neighbor" policy. Also, the industry spokesmen acknowledged that, since there was the possibility of an oil spill, there were plans to avoid such an occurrence and competent means of containing a spill should it occur (Kodiak Daily Mirror, Nov. 18, 1981:1).

In January 1982 representatives from Chevron returned to Kodiak to update the community, through the OCS Task Force, with information of their exploration activities (Kodiak Daily Mirror, Jan. 26, 1982 and Jan. 28, 1982). During April 1982 Chevron conducted geohazard tests and, in an important act of cooperation, held these tests ahead of schedule in order to avoid conflicts with halibut fishing (Kodiak Daily Mirror, April 28, 1982). The firm also planned to avoid summer testing so as not to conflict with fishing during that period (Kodiak Daily Mirror, April 29, 1982). Cooperation between the community, the fishermen, and the oil companies appeared to be going smoothly until September 1982, when Chevron announced plans to conduct seismic tests in Shelikof Strait. The technique to be used involved dragging an expensive, lengthy cable behind a ship. An initial problem was scheduling the test vessel into the area at a convenient time. Other commitments and bad weather had delayed its arrival in Kodiak until well into the crabbing season (Kodiak Daily Mirror, Sept. 23, 1982).

Local fishermen were convinced that the testing would disrupt the crab fishery. As one news report noted, "'God Almighty, they're talking about running right through an area full of crab pots,' said Al Burch, manager of the Alaska Draggers Association. 'It's building up to a real volatile situation'" (Kodiak Daily Mirror, Sept. 15, 1982). This feeling was supported by Jeff Stephans, head of the United Fishermen's Marketing Association, the other fishermen's association in Kodiak. In a very pointed "letter to the editor" on the issue, he criticized Chevron for what he considered to be a difference between what they said they would do and what they actually were doing (Kodiak Daily Mirror, Sept. 17, 1982). On September 23, 1982, Chevron representatives met with fishermen to discuss the situation. Noting that the seismic testing equipment was worth over $2 million one representative stated, "We don't want to damage our equipment any more than we want to damage anyone's crab pots" (Kodiak Daily Mirror, Sept. 24, 1982:1).

The Chevron representatives stated that they learned a great deal about the crabbing industry at that meeting. One lesson was that crab fishing is a competitive enterprise and that crab fishermen, to keep their competitive edge, are often secretive about their strategies. The Chevron team had approached the fishermen with what appeared to industry to be a rational suggestion regarding the seismic vessel's operation in waters filled with crab pots. First of all, they asked how many crab pots were in the area. Secondly, Chevron assumed the pots stayed in one location all season and the spokesmen explained that if the fishermen would tell them the exact locations then the seismic vessel could avoid the pots. In answer, the fishermen stated that they weren't sure how many pots they would be using, that they would be frequently moving their pots to differing locations during the season, and finally that they would not divulge their location. Some fishermen were afraid that their competitors would be able to identify where successful pots were and move into the same area; others were suspicious that Chevron would move the pots if they were in the way of the seismic vessel's path.

One outcome of the meeting was a decision by Chevron to conduct a "trial run" through the Strait to see if there would be any interference with crab pots (Homer News, Sept. 20, 1982: 1,19). As part of an agreement with the fishermen, Chevron allowed one observer from each of the two Kodiak fishermen's associations on board the vessel during the test run. During the operation the ship ran across at least two strings of crab pots and Chevron halted the tests. "We said we'd shut down the operation if we encountered any problems with crab pots and that's what we did," stated a Chevron representative (Kodiak Daily Mirror, Sept. 28, 1982). Chevron also paid compensation for the lost gear. There was a mixed reaction to these events. Some fishermen felt Chevron had a right to their activities and that the company had tried hard to cooperate with the fishermen and keep them informed of the industry's activities. Other fishermen felt the conflict with the pots confirmed the fact that Chevron should not have run their tests during the crabbing season (Kodiak Daily Mirror, Sept. 28, 1982; Oct. 1, 1982:2).

Another outcome was the establishment of a "working group" between fishing and oil industry interests. In early October 1982, representatives of the two interests met and agreed about the need to establish communications and set policies for the mutual benefit of the two groups. Seismic mapping and other exploration and development activities were to continue in the foreseeable future in anticipation of additional lease sales. Both industries would be using the same areas and agreements in advance would lead to an orderly use of the ocean. Examples of policies considered by the representatives included no seismic testing during the relatively short crab season, and the use, in order to spot fishing gear, of high intensity lights (crabbing lights) by seismic vessels working at night (Kodiak Daily Mirror, Oct. 11, 1982:1-2).

The need for this sort of organization was reinforced in December 1982, when three local fishermen reported gear losses from oil exploration activities. The event highlighted the fact that oil companies are required by federal law to compensate fishermen for gear losses (Kodiak Daily Mirror, Dec. 8, 1982).

The gear loss also brought attention to the question of state and local comment on seismic testing activity and permitting. Though not opposed to drilling in Shelikof Strait, the Kodiak Island Borough wanted certain restrictions placed on where and when the drilling could occur. The local government's specific interest was to prevent disruption of the tanner crab fishery and to avoid potential environmental degradation. Particular concern was felt for fish stocks vulnerable in the early spring when an oil spill would be hard to clean up because of adverse weather conditions. The borough suggested OCS work be conducted from late spring to early fall; when this offer was not accepted, the local government compromised by calling for a two-month restriction period. However, the State of Alaska overruled the borough's objections, and approved Chevron's exploratory drilling operation plans (Anchorage Daily News, June 1, 1983:C-1; Kodiak Daily Mirror, March 9, 1983:1, June 1, 1983, and June 13, 1983).

In February 1983 hearings were held in Kodiak on a draft environmental impact statement (EIS) for lease sale 88. A large area of the Gulf of Alaska, including the southern portion of Cook Inlet and most of Shelikof Strait, was being offered. Most of the people attending the hearing were fishermen, and they spoke in favor of deleting Shelikof Strait from the lease sale. Many individuals felt the unproven oil potential in Shelikof Strait was not worth damaging the proven fishing resources (Kodiak Daily Mirror, Feb. 15, 1984). The fishermen's position in this case was consistent with the one they had taken in earlier years.

Efforts to improve relations between the fishermen and the oil companies continued. The informal Alaska oil and fish working group began the process of incorporating as a non-profit organization under Alaskan state laws. A major purpose of this formalization was to continue to improve communications between the two industries. Progress was demonstrated by what appeared to be a softening of the fishermen's stance towards the oil companies. Jeff Stephans, manager of the United Fishermen's Marketing Association and long-time critic of the oil companies, stated, "Personally, I've come a long way regarding my feelings on oil and gas. I'm far more sympathetic than I was six years ago, partly because of my contacts with members of the oil industry" (Kodiak Daily Mirror, July 26, 1984, and Stephans, Text of Speech to NOIA, July 17, 1984). In September 1984 the oil/fisheries group became incorporated (Kodiak Island Borough OCS Advisory Council draft minutes, Oct. 9, 1984). Among other projects, the group has published a detailed manual for the use of both fishermen and seismic explorers on the activities of each industry.

Changed Attitudes Towards OCS Development

In October 1984 Chevron announced that it would begin exploratory oil drilling in the Shelikof Strait around the middle of November. The announcement was made to the Borough OCS Advisory Council. The drilling rig to be used was the "SEDCO 712," a floating platform stabilized by eight anchors. The anchors were to be well marked so that fishing boats could avoid them; operations were targeted for completion before the start of the tanner crab season; the well would be safely capped when drilling was finished. Chevron repeated its desire to avoid conflict with fishing interests. The oil company representatives also stated that the drilling operations were expected to have little effect on Kodiak city because the rig would be supplied by vessels based in Kenai and helicopter support based in Homer. In a somewhat surprising move, the OCS Advisory Council members unanimously decided to send a formal letter to Chevron requesting the firm consider using Kodiak for the helicopter staging area.

The extent of the shift in attitudes is reflected in the voting prior to the final adoption of the resolution. The original motion stated that the OCS Advisory Council should "encourage any economic benefit for the Kodiak community that might occur from the rig activity in Shelikof Strait" (Kodiak Island Borough OCS Advisory Council draft minutes, Oct. 9, 1984:3). An amendment was proposed to add "that would not directly interfere with ongoing fishing activity" (Kodiak Island Borough OCS Council draft minutes, Oct. 9, 1984:3). The vote on the amendment was tied at five to five; the tie was broken with an affirmative vote by the chairman. Reflecting on the significance of the action, one local newspaper commented "Half of the members wanted to send an unequivocal invitation to Chevron; the other half wanted to maintain OCS [council's] previous position which consistently has placed fishing as the area's top concern" (Kodiak Daily Mirror, Oct. 10, 1984:1).

The Advisory Council's position was also adopted by the Kodiak Area Chamber of Commerce. In a letter to Chevron they stated, "By unanimous vote, our Board of Directors urges that Kodiak be designated as Chevron's base of operations for all support services for your exploratory drilling site" (Kodiak Island Borough OCS Advisory Council, file data). The Chamber felt that as long as the drilling operations did not interfere with fishing, Chevron should reconsider the Kenai/Homer site in favor of Kodiak.

Kodiak Island Borough manager, Jerome M. Selby, also sent a letter to Chevron formally asking the firm to consider Kodiak for their support base operations. In this letter Mr. Selby offered the following reason, "As you are aware, the economic downturn due to the loss of the king crab fishery is a grave concern to the community at this time. Any consideration you can give to this request would be appreciated" (Kodiak Island Borough, file data).

Although Chevron expressed no opposition to supplying its exploratory rig out of Kodiak, the company did not do so. Materials, services, and other necessities were already present in Kenai and Homer, and it made little economic or logistical sense to set up new operations in Kodiak dity. Instead, the Kenai peninsula sites were used as support bases for the exploratory operations. Members of the Borough OCS Advisory Council asked to be allowed to visit the oil rig, at Chevron's convenience (Kodiak Island Borough, file data). To accommodate the request, Chevron invited 14 Kodiak residents on board the oil rig SEDCO 712 in early January 1985. The visit, with photos and explanations of procedures, was reported in the Kodiak Daily Mirror, thereby providing newspaper coverage for the readers in Kodiak. Part of the drilling procedures included a monitoring camera 90 feet below the water line, with a TV screen in the control room. Codfish were seen swimming across the screen, which prompted one of the visitors (the owner of a crab boat) to ask if the operator could turn the camera around to look for crab.

In spite of the efforts to increase communication and establish friendly working relations between the industries, some difficulties remain. For example, Chevron had hoped to complete the test well in Shelikof Strait before January 15, 1985--the opening of tanner crab season. However, the undersea rock formation proved harder than anticipated, and drilling was not completed until about two months later. Many tanner crab fishermen were disturbed about the delay in moving the rig. First of all, the drilling platform and the attendant stabilization anchors took up an area of over two square miles. Several fishermen felt these were prime crabbing grounds lost to them. Secondly, there was concern that the vessels supplying the oil rig would inadvertently run over crab pot buoys and lines. Chevron agreed to supply the rig only during daylight hours in order to minimize this risk (Alaska Fishermen's Journal, Feb. 1985:14-15). The drilling platform was pulled out of Shelikof Strait in mid-March 1985. When the well was capped, the drilling pipe was cut off ten feet below the mudline to avoid hindering future bottomfish operations. As an indication of the feelings about this experience, the UFMA manager commented at this time, "If Chevron, or any other oil company, comes back, we'll look forward to working together again" (Kodiak Daily Mirror, March 21, 1985:1).

Implications of the Shift in Attitudes

As seen in the above description, relations between fishing and oil industry interests have changed considerably. In the 1970s and early 1980s, many fishermen maintained strong opposition to OCS development. At their most vehement, some who voiced this opposition were proponents of action to prevent threats to the fisheries from OCS (Payne 1980). However, in an attempt to resolve the conflicts, strong efforts at organization, cooperation, interaction, and education were adopted by both industries.

One aspect of the relationship was that both groups simply had to learn about each other individually and about each other's industries. The approach of sharing information was constructive and, with few exceptions, improved relations between the two parties as the 1980s progressed. Even so, some Kodiak residents still maintained their "fish first, as little OCS as possible" position.

Several determinants contributed to the ultimate shift in the residents' attitudes. First of all, through contact, cooperation, and education Chevron's activities were no longer so alien as they seemed in the 1970s. Ocean-based oil and gas exploration had become more familiar. This familiarity improved the emotional climate. But the deciding factor, as stated in the Borough manager's letter quoted above, was the dramatic downturn in the fishing economy, specifically the crab fishery. As long as Kodiak's fisheries were doing well, there was no reason to support economic diversification; on the contrary, many reasons could be put forth to avoid inviting an industry that might harm or compete with fishing. But then the bottom fell out of the crab industry. In a short period of time fishing no longer was able to provide a consistent economic base. People who had previously been in favor of economic diversification, including OCS, but had kept silent, began to speak out. Even hard-core OCS opponents began to realize something had to be done to augment and/or diversify the local economy. As one Kodiak resident noted, "Basically Kodiak was battered and beaten and the fishing industry had lost its credibility."

Part of the interest among fishermen in Chevron's activities centered on the possibility of work. According to a knowledgeable Kodiak resident after the news of Chevron's drilling activities was released, several unemployed fishermen approached the oil firm in hopes their boats might be used to provide tendering services to the drilling rig. This informant also noted that people other than fishermen were in hopes that new jobs would open up because there was so little opportunity in fishing-related industries.

Another factor contributing to the attitude changes was a slow but steady erosion of interest in OCS activities. To some extent oil and gas development has become a non-issue. In the beginning there was high interest, some fear and anxiety, and lots of emotion surrounding OCS topics. But over time, since little activity has occurred, people have lost interest. Fishermen have grown tired of repeatedly discussing and publicizing the same issues and concerns regarding OCS development; "They've become worn down," in the opinion of residents familiar with the controversies.

Summary

On the face of it, one could assume from the recent reversal in policy that fishermen and other Kodiak residents are now in favor of OCS development, especially if it were to produce economic benefits for Kodiak. This may be misleading. Just because the fishermen are now quieter on the issue does not mean they are in total favor of OCS. More realistically, there appears to be ambivalence regarding ocean-based oil and gas activities. On the one hand, if petroleum exists in sufficient quantities to warrant production, then Kodiak residents want to share in the economic benefits of the development. But as the Chevron/Shelikof Strait exploration venture demonstrated, Kodiak could be bypassed in terms of direct economic involvement.

On the other hand, if there is a reversal in the downward economic fortunes of the fishing industry, then in all likelihood some of the opposition to OCS development would reappear. Fishermen probably would regain the economic and political power-base they once had when opposing the oil industry, even though the intensity of their antagonism undoubtedly would be more tempered than in the late 1970s. With the resurgence of fishing, the argument would still hold that it is not worth risking the marine environment, especially if there is to be no local economic gain from OCS activities.

Family Relations

Family relations are central to a community's life. This is especially so in a place like Kodiak city, where the unique characteristics of fishing families can be found. Certain socioeconomic and demographic features of Kodiak impinge on family relations. The recent decline in the fisheries has placed new burdens on these relationships and exacerbated some traditional pressures.

One fact is that there are more males than females in Kodiak city: 46 percent females to 54 percent males in both 1970 and 1980 (U.S. Census Bureau 1982: 3-45 and Payne 1980:19). The added male population of the Coast Guard base (only two to three percent of the service personnel are female) adds to this imbalance (Optima Associates 1983:12). Because of this, there is competition for available women. This demographic characteristic, combined with the pressures of a fishing lifestyle and the economic fluctuations of recent years, has complicated the maintenance of stable relationships.

CHARACTERISTICS OF FISHING FAMILIES

There are several properties that distinguish families whose main occupation is fishing. One is that spouses are often separated from each other for long periods of time. During separations, wives are expected to assume responsibility for the "home front." Along with regular duties like child care, can be maintenance of a house, vehicles, second or third boats, and business paperwork and accounting. The latter can include paying business bills, attending fishery related meetings, keeping informed on current events in the fisheries, and a host of other activities. If wives and their husbands are engaged in several fisheries and have large capital investments in gear and boats, these responsibilities can assume major proportions.

Individuals actively engaged in this lifestyle report that it is a common belief that stable and successful marital relations come about when the husband assumes responsibility and authority for actual fishing operations and the wife assumes responsibility and authority for the domestic sphere and for on-shore fishing business affairs. As long as this division is maintained, according to the belief, the relationship will work and be good. It is also reported that friction occurs when husbands return from fishing and seek to assert a more traditional authoritarian role in family life. On the one hand, the wife and children have adapted to a style where the wife makes many decisions; on the other hand, when the husband returns he may try to preempt this responsibility.

Related to this are the expectations each spouse has of the other. For example, upon returning from a fishing trip the husband may expect his wife and children to express appreciation of the effort he has put forth and the danger and strain he has experienced. The wife on the other hand may anticipate the husband will appreciate her efforts, and show regard for the problems she has faced while he has been away. As one person commented, "He wants to go to the bar, relax, and let go of responsibilities from fishing, and she wants him to fix the bathroom and hear all about what a problem the kids have been." The strength of a relationship may depend on how couples handle these expectations. Finally, it must be acknowledged that fishing, and occupations related to the industry (like the Coast Guard and Fish and Wildlife Protection), have inherent dangers. The number of lives and vessels lost each year attests to these objective risks. Needless to say, for some individuals the dangers add emotional pressures to family relationships.

Characteristics of the Community's Location

For some families, Kodiak's relative isolation, harsh weather, and lack of familiar urban amenities add to the strains they feel. According to several long-time observers, the town is more attractive to men than to women. For men there is the outdoor lifestyle with activities like hunting, fishing, and camping. These features tend not to be so appealing to women, especially wives with young children. Several individuals mentioned that families attempt to overcome these problems by consciously planning recreational activities that include the whole family. Rather than just the husband going off on a hiking adventure, the entire family makes the trip.

One mechanism that helps people adapt to the location is the development of friends and associates who are supportive. For many residents (notably newcomers and Coast Guard families) there are no extended family members nearby to turn to for companionship. Individuals often compensate by the development of family-like relations with others to whom they are unrelated (see Dixon 1978:199). The relatively rapid turnover of people in Kodiak (as in Alaska in general) tends to make these relationships short lived, though supportive during their duration.

Another characteristic of the region is the presence of the Coast Guard station. The pressures on Coast Guard families are succinctly summed up by Optima Associates (1983:50) when they describe their counseling needs:

> Counseling needs reported range from depression (said to be considerable during the winter months) to reactions to separation when the boats leave, constant fear during air flight search and rescue missions, family problems heightened by separation from supportive networks and the isolation of the living environment. The often repeated "truism" on the base is that strong relationships will improve, but problematic relationships are sure to end in divorce during the deployment period.

Coast Guard authorities are aware of the problems encountered by families during their tour of duty in Kodiak. Efforts have been made to improve the situation and remove some of the pressures. For instance, housing on the base was in extremely poor condition when the Coast Guard assumed command from the Navy. New housing is being built as fast as possible to improve living conditions. There is "sunshine liberty" and "environmental morale leave" which lets individuals leave Kodiak for short periods for rest and recreation. Another arrangement that allows families to get away exists for medical services. Family members can fly to Elmendorf Air Force Base in Anchorage for medical treatment not available in Kodiak. Many wives take advantage of these trips to shop and participate in Anchorage's urban life.

Other preventive actions taken by the Coast Guard include the construction of more recreational facilities and planning more base activities. Marriage, mental health and alcohol and drug counseling are available. Coast Guard wives support groups attempt to assist each other and newly arrived dependents to adjust to life in Kodiak. One piece of advice frequently given Coast Guard wives is to keep active in order to avoid the potential boredom, unfamiliarity, and stress of living in Kodiak. Estimates are that approximately two-thirds of the wives work, the majority off-base. At least 40 percent of the staff at the Kodiak hospital are Coast Guard dependents. Other wives work for the school system, government agencies, in retail stores, and some work in the fish processing canneries, as do some of the enlisted personnel (Optima Associates 1983:16).

Effects of the Economic Downturn

The decline in the fisheries added to the usual family strains, to the specific pressures of living in Kodiak, and to the stresses of a fishing lifestyle described above. When individuals were asked what happened to fishing families during the economic decline, they unanimously stated that it had a severe effect on family relations. The impact must be seen in relation to the reality and expectations of family life during productive years of the fisheries. In the 1970s and early 1980s, the upward economic spiral brought high incomes and an affluent lifestyle to the successful fishing families. The expectation of a similar lifestyle existed for those working their way up the economic ladder.

When asked in connection with this research to recall what life was like in the boom days, individuals sounded several themes. Some of the accounts may have been exaggerated and some stories may have gotten more expensive in retrospect, but the descriptions fit reality for some families. One theme had to do with housing. At a time when it was scarce and expensive, very good housing was purchased by successful fishing families. Another element in the accounts of boom days was investment strategies. Successful families were able to invest their profits in larger vessels and better fishing gear, with the expectation of increased profits from this investment. Another theme had to do with leisure activities. During periods when there wasn't any fishing, some families went on world-wide tours. Others spent time in condominiums purchased in Hawaii. Some of the children of fishing families anticipated that they would automatically receive a new vehicle for their sixteenth birthday. At the local school it was a joke among some teachers that the students made more money from summer fishing as deckhands than the teachers did all year. In the boom years, fishing was seen as a successful profession where hard work and diligence would be rewarded by success, high profits, and an accompanying affluent family life.

The economic downturn had an immediate effect on family finances, or as one woman said, "This week we eat, next week we don't." More injurious, however, are some of the long-term consequences. Critical to a person's occupation are boats and jobs. Investments in boats in some cases were lost and jobs on crews disappeared. For many who still own their vessels, there is a lingering fear that they may yet lose them. Work for deckhands continues to be hard to find. Older couples who planned to sell their fishing property (capital equipment, vessels, Limited Entry permits, etc.) in order to retire, have seen their life's investments shrink in value and now they must continue to fish. For example, one person noted their $1.3 million vessel was now worth $275,000, "if we could sell it." Similar difficulties have befallen housing. Homes bought during the good years have had to be sold or lost to the bank. And this has come at a time when the housing market is depressed because of the economic slowdown and an increase in housing stock. Cars have been repossessed or sold. Trips and vacations have been cancelled.

It goes without saying that having one's savings wiped out and seeing one's investments diminish to a quarter of their value has a profound effect on personal relations. Many families have had to alter their life-style dramatically, including cutting back on all spending. This means eating less well, going to the doctor or dentist less frequently, not carrying insurance, etc. Cost cutting in the family fishing business can also jeopardize the life of the husband/father. Not performing a pre-fishing season vessel inspection, having only one radar on board, and hiring inexperienced crewmembers can all increase risks at sea. Relations have been strained as family members acted to help out. Many wives took second jobs to provide additional support. But during the profitable years they did not have to work outside the home (or beyond their involvement with their family's fishing business), so this was a new experience for these wives. Some doubted their competence of training, even though many had skills learned while taking responsibility for the business end of the fishery operation.

A wife working with a husband staying at home was a new arrangement for many couples, and the experience brought problems for some. On top of this, where the husband is still fishing and the wife has gone to work outside the home, the couple has even less time than before to spend together. In some instances it has been reported that a wife has gone to work only to have her paycheck garnished to settle her husband's back taxes, even those unpaid for a period prior to their marriage. In these situations the husband had not paid his income taxes in expectation that the following year would be "better and bigger," allowing for an easy payment of the past due taxes. But that was not the case; instead the fisheries declined.

End Results of the Economic Situation

All of these economic, psychological and social adjustments have taken their toll. Many fishing families simply moved from Kodiak to other fisheries, such as Hawaii, the Gulf of Mexico, Florida, or the West Coast. Some families left fishing as an occupation entirely. Those that remained in Kodiak city have displayed several indicators of stress. A number of these are discussed in the accompanying sections on mental health, and drug and alcohol abuse. There has been an increase in divorces relative to the population growth; a proportion of these divorces should be directly attributed to the economic decline according to these experts. Divorces also occurred in locations other than Kodiak in families that had moved. There were even cases of "pro forma" divorce, where the married couple would obtain a divorce in name only so the divorced wife would be eligible for public assistance and food stamps.

Table 259 presents statistics from the recently opened Kodiak Women's Resource and Crisis Center. Its inspection indicates that spouse abuse and domestic violence have increased during the period of the decline in the fisheries. Those knowledgeable about the figures are quick to point out, however, that the statistics are not of long enough duration to provide clear enough evidence of a correlation between the decline in the fisheries and the growth of domestic violence. There is the possibility that more accurate reporting may have produced the observed increase.

Specialists working in Kodiak, however, are willing to make observations about their experiences. They believe that a general relationship has been demonstrated between an economic decline and an increase in domestic violence. They have also observed that when fishing is bad, some fishermen will start drinking and domestic violence will increase. They note further that there often is a time lag between the onset of the economic decline and the appearance of domestic violence. This occurs because the families initially strive to maintain themselves both psychologically and economically; but as resources and opportunities diminish the pressures can eventually result in domestic violence, usually associated with alcohol abuse. As one counselor noted, "Financial problems can be the chink in the armor of an otherwise good relationship. It often depends on the strength of the husband's self esteem." The recent decline in the fisheries did little to support the fishermen's sense of self esteem. One anomaly seen by Kodiak professionals is a sudden increase in domestic violence when the fishing is

TABLE 259

Case and Service Statistics for
The Kodiak Women's Resource and Crisis Center:
July 1980-December 1984

CASE DESCRIPTION	July 80-June 81	July 81-June 82	July 82-June 83	July 83-June 84	July 84-Dec. 84[1]
Domestic Violence Reports	106	72	223	207	93
Sexual Assault Reports	24	11	28	29	12
Incest Reports	6	3		16	7
Shelter Clients (opened 2/83)			56	126	66
SERVICES PROVIDED					
Advocacy	146	91	361	322	92
Legal Assistance		21	608	456	161
Counseling Sessions	165	219	1,344	2,144	977
Shelter Nights (safe home)	31	16	418	1,209	734
Resource Contacts	241	416	1,232	1,644	409

[1] Six months only

SOURCE: Kodiak Women's Resource and Crisis Center. File data, 1985.

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good. Of short duration, this abuse seems to occur whenever the fleet returns to town. The professionals have learned to prepare for these short intervals of violence.

The forerunner of the Kodiak Women's Resource and Crisis Center began in 1977. Designed as a resource center, the early efforts were directed to women and children subject to domestic violence. Initially, family crisis assistance was operated through a number of "safe homes." These were local residences where women and children could effectively seek anonymous shelter for a few days, until the home situation was stabilized. However, in a small community like Kodiak, "where everyone knows everyone else," it is difficult to keep the locations secret, so efforts were undertaken to construct a permanent facility. In February 1983 the new shelter was opened. This facility offers both resource and family crisis services (Table 259 lists the types of services available). The center serves the entire island and trips are made by professional staff to the villages twice a year.

FUTURE PROSPECTS

The effects of the fisheries decline on family relations will probably remain for the next few years. Further strains may be placed on those families that attempt to enter new fisheries. Because of past losses, credit will be harder to obtain; loans for equipment to catch different species of fish will not be easily granted. Insurance rates and other costs related to fishing undoubtedly will increase. The low price bottomfish command will mean the fishermen who have entered this fishery must work for longer periods than previously. Fishing at a further distance from Kodiak will also increase the time away. The result will be longer periods of separation for family members; more holidays and special family occasions will be missed, and more time at sea will increase the possibility of injuries and death for fathers and husbands.

On the other hand, some indicators suggest the fishing families may again prosper. Vessel owners are diversifying and looking to other geographical areas for opportunities. Wives are continuing in jobs outside the home and both spouses are attempting to cut all costs. Counseling services are available and fishing families support each other. Perhaps the best summary is the saying, "We're all in this together so we'd better work together." This folk philosophy was heard on the larger social and political level, as well as in reference to family relations.

Mental Health

The community's mental health needs are served by the Kodiak Island Mental Health Center (KIMHC), which began operation in 1970. Its services are available to all residents of Kodiak Island, including Coast Guard personnel and their dependents. The latter make up approximately 40 percent of the caseload. Fees are based on a sliding scale; additional funding is provided by local and state sources. The Center is an agency of the Kodiak Borough and is goverened by a board of eight members. The counseling staff includes two clinical psychologists, a psychiatric consultant, two psychiatric social workers, and a mental health associate. Major services include outpatient care, inpatient care, partial hospitalization, emergency services, and education and consultation. Diagnostic services are provided for community agencies and a residential training program exists including supervised living units, semi-independent apartments, and a work activity center (Kodiak Island Mental Health Center n.d.).

In 1979 the most commonly reported mental health problems were depression, anxiety, and personal crisis. Kodiak's isolation, inclement weather, economic fluctuations, and a lack of familial friendship and neighborhood support systems for newcomers contributed to these conditions (Payne 1980: 111). Also, many newcomers find there are limited recreational, educational, social and cultural opportunities compared to what they experienced in the lower 48.

Difficulties for Coast Guard personnel and their dependents include family disruption, winter depression, lack of transportation, and prejudice about using town facilities. On-base housing was a sore point for some personnel who lived at Nemetz Park. It is an older, government-owned housing project with approximately 230 units. Many units had deteriorated and their conditions lowered the morale of the residents. However, in 1985 the area was undergoing the sixth phase of a major rehabilitation to improve the housing units. The number of units was also being reduced to about 200 (Optima Associates 1983). For Coast Guard families there also exists "The uncertainty and fear created by the dangerous nature of Search and Rescue operations and the risks of those on ships . . ." (Optima Associates 1983:10). This is true as well for fishermen.

In 1984 the mental health picture had changed from that of 1979. As one Kodiak psychologist noted, "A collective depression has set in, and it's pretty grim." There was a dramatic increase from 1981 through 1984 in the average monthly caseload served by KIMHC. Though this cannot be attributed, in a direct one to one casual relationship, to the decline in the fisheries, the economic pressures of the last few years have undoubtedly played a major role in the increased caseload. The use of drugs and alcohol complicates matters. It is known, for example, that some crab fishermen used cocaine to help stay awake during extended periods of the crab harvest. During the good years the drug could be afforded and its use even had a certain status because of its high cost. Unfortunately, continued use during lean years has compounded existing pressures. As one Kodiak person noted, "People who are desperate for money will do some desperate things."

All of this affects the family. According to one Kodiak psychologist, there is a high rate of family crisis. Many of the marriages during the fishery boom occurred in an atmosphere of high expectations. Even for those not directly involved in the profits of the crab industry, the success of the industry added to their expectations. A feeling of prosperity and, perhaps more importantly, a sense of opportunity, pervaded the community. When the economic bust set in, these beliefs were disrupted. The conviction that a progressively more prosperous economic condition would continue was threatened. The psychologist observed that the change was particularly disruptive for some of the children who grew up during the boom years. Some young men in the town who grew up during the boom are still trying to remain in that period, almost as a prolonged adolescence.

In summary, the economic depression in the fisheries has contributed to the increase in mental health problems in Kodiak. It is not the only cause, but the bust has interacted with and compounded the severity of previously existing conditions such as isolation, separation, and dangerous lifestyles.

ALCOHOLISM AND DRUG ABUSE

In 1979 Payne reported (1980:106) that alcohol abuse was viewed as a major problem in the town of Kodiak. The Kodiak Island Borough Health Resources

Council cited it as the number one health problem in a 1975 report, and statistics from the mid- to late 1970s supported this contention. Statistics, research findings, opinions of professionals involved in substance abuse treatment, and citizen opinion all suggest the problems still exist. Alcoholism may have worsened in the 1980s, and the patterns of alcohol use and abuse appear to have changed. Drug-related behavior has gained attention, and many regard it as a problem as severe as alcohol abuse.

Extent of Substance Use

In 1981 a survey conducted by KMXT, the local public radio station, found drug and alcohol abuse a major concern in Kodiak. A similar survey in 1982 found it the second major problem, after fishing and limited entry, which were the respondents' first concerns. In 1982, a separate survey conducted by the Kodiak Community College put alcohol and drug abuse in first place. This survey also found that every person contacted in Kodiak knew between four and ten drug and/or alcohol abusers (Kodiak Council on Alcoholism 1984:158-159).

In 1983 the Kodiak Island Borough School District, in cooperation with the local PTAs, the Chemical People and the Kodiak Council on Alcoholism, conducted a student survey on drug and alcohol use in the school district. This study found eighth graders using cocaine, marijuana, and alcohol at double the rate of eighth graders in Colorado and Minnesota. Twelfth graders were using cocaine at twice the national average. Juvenile probation statistics indicate that 64 percent of the agency's clients have alcohol and drug related problems. The Kodiak Police Department reported in 1982 that 88 percent of all arrests were alcohol-related, which is about 30 percent higher than elsewhere in Alaska. In 1983 the Kodiak Women's Resource and Crisis Shelter reported that 42 percent of the clients misused drug and/or alcohol. Ninety-seven percent of the men identified as abusers of women had alcohol and/or drug problems. In 1983, 10 percent of all admissions to the Kodiak Island Hospital had a primary or secondary diagnosis related to drugs or alcohol (Kodiak Council on Alcoholism 1984: 159-160).

Statistics for the recent history of drug and alcohol arrests and numbers of clients served by the Kodiak Council and Alcoholism are provided in Table 260. Though alcohol arrests have changed somewhat over time, no clear pattern can be noticed. The number of drug arrests and "clients served" have increased over time. The increase in drug arrests coincides with the increasing frequency of cocaine use, discussed below. The increase in numbers of clients served by the Council on Alcoholism reflects a greater awareness of substance abuse problems and an aggressive program stance by the agency.

There has been a decline in the use of barbiturates and amphetamines. Marijuana has maintained about the same or decreased slightly in use and heroin is considered minimal to no use at all. However, according to agency personnel, cocaine has become the drug of choice in Kodiak, and has

TABLE 260

Kodiak City Alcohol and Drug Arrests and Kodiak Council on Alcoholism Client Population: 1977-1984

Year	Alcohol[1] Arrests	Drug[1] Arrests	Clients[4] Served
1977	279	16	
1978	303	18	
1979	224	34	126[5]
1980	174	10	249
1981	157	12	220
1982	201[2]	35[2]	324
1983	166	28	409
1984	195[3]	43[3]	392

[1] SOURCES: 1977-1979, State of Alaska, Criminal Justice Planning Agency, Office of the Governor.
1980-1981, State of Alaska, Criminal Justice Planning Agency, Department of Law.
1982-1983, State of Alaska, Department of Public Safety.
1984, Kodiak City, Department of Police, Monthly Activity Report.

[2] Months reported: January-July, September-December.

[3] Through June 1984 only.

[4] Source: State of Alaska, Office of Alcoholism and Drug Abuse. File Data, 1985.

[5] Prior to 1979 the recording system was manual and considered unreliable.

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increased dramatically in frequency of use and quantity of users. Cocaine use is also considered the drug of choice in Alaska in general, and is considered in epidemic proportions by some sources (Anchorage Daily News, March 14, 1985: A-4 and March 17, 1985: A-1, A-14). Several individuals close to the drug situation in Kodiak stated that, "Just about everyone is using it recreationally or addictively." Though this may be overstating the case, it underscores the presence of cocaine use in Kodiak.

Changes in Patterns of Usage

According to agency personnel, patterns of behavior have changed in the 1980s. In general, the shift has been from heavy social alcohol consumption (in bars, for example) and marijuana use to more domestic alcohol consumption and widespread cocaine use. Also, there appear to be differences in alcohol and drug use between ethnic groupings. The Kodiak Police characterize major users generally as follows: whites consume alcohol, cocaine, and marijuana; Natives use alcohol and marijuana; and Filipinos use marijuana. In the 1970s, when the fisheries were extremely productive, Kodiak was known as a "hard drinking" and "partying" town. Much of the activity centered in the bars. Men returning from fishing trips would drink heavily and party intensely. The bars were, and continue to be, an important setting to obtain a job, thus impelling prospective job seekers to frequent these locations. Marijuana was very popular. Though not as popular, cocaine was a high status drug, but affordable only by those making high wages. The decline in the fishing sector of the economy can account for some of the continued substance use and abuse, and possibly for changes in the use patterns. A complicated set of events is involved. The fact that many individuals who used to have fishery-related jobs are now out of work is one factor; if there is resulting family disruption, matters are worsened; personal depression can ensue. The community's response only adds to the problems. As one fisherman noted, "Now we're the mockery of the town, not the ones who are looked up to."

Cocaine. During the years when fishing was lucrative, many people became accustomed to using cocaine; then they could afford it. Now the high wages have decreased but the desire for cocaine has not diminished, and has in some instances increased. For example, according to the professionals, there are a number of women in Kodiak who are referred to as "coke whores." These are women who have become so addicted that they are willing to trade sex for cocaine.

Several factors have promoted the increasing popularity of cocaine. Besides being a high status drug, it has declined in cost as the quantity reaching Kodiak has increased. And the quality has gone up, as well (Anchorage Daily News, March 1, 1985: A-1, A-14). Finally, it is a drug by which money can be made. A complex network of importation, dilution, and distribution exists. The Kodiak Police Department provided the following example. If a kilogram (2.2046 pounds) is purchased in Columbia for $16,000, when it reaches Florida it could sell for $30,000. By the time it reaches Anchorage, the same kilogram could sell for $50,000. In Kodiak, 90 to 99 percent pure cocaine is cut in half, making it about 45 percent pure, and then cut in half again, resulting in a product around 20 percent pure. The drug has now increased in volume to approximately 4,000 grams, each of which could sell for about $150. The kilo is thus worth a total of $600,000, less the initial investment and transportation costs. This is attractive profit for those willing to accept the legal risks involved. According to the Kodiak Police, about 80 percent of their "crime stopper" incidents are related to cocaine deals. ("Crime Stoppers" is a program where the police offer a possible reward and anonymity to any providing information on crimes.)

Alcohol. In previous years there was a lot of "rowdy" drinking in the bars in Kodiak. Wages were high and the population of fishermen and cannery workers was larger. Fishing crews would arrive in town at all times, on any day. Often they felt a need to "let off steam" after arduous, lengthy and dangerous fishing voyages. Profitable trips were celebrated; unsuccessful ones were mourned.

There is a mystique about alcohol use in Kodiak, supported by a large body of popular oral tradition stemming from the drinking patterns of the successful years. Stories of crabbing crews "six packing" or "casing" all patrons of a bar are frequently told, and "ringing the bell" (i.e., buying a round for the house) occurred often, according to these stories. In addition to the mystique, there is a social pattern that includes the expectancy that fishermen will participate in recreational activities (including drinking) with the same intensity that they bring to fishing enterprises. A sense of optimism, and the very real successes of the "boom" years, supported this pattern. Alcohol consumption has continued, though in a different pattern, during the fishing decline. Daily drinking has now changed more to a sequence of Friday, Saturday, and Sunday consumption. Part of this may come from the fact that decreased fishing means boats do not arrive at all times of the week. Kodiak police indicate they no longer have to quell large bar brawls, as in past years. Instead they note increase in domestic violence involving alcohol use in the home. In terms of DWIs (driving while intoxicated) the police state that on average they are making two to three arrests per day. Also, they find, as a rule of thumb, that in cases of theft, if the value is under $500 it will be alcohol-related; whereas, if the theft is over $500 it will be drug-related (usually for cocaine). The police feel that about 90 percent of their misdemeanor arrests are related to alcohol.

There are differences between groups in terms of alcohol use. For adolescents, there continues a pattern of "picking up a couple of six packs and heading out the road" that existed in 1979 (Payne 1980:107). According to one alcoholism counselor, there is concern regarding increasing use of alcohol by adolescents. Some village residents come to Kodiak and become involved in heavy alcohol use for a short period, after which they return to their villages. The Council on Alcoholism would like to assist those desiring treatment, but the need to return to the villages makes consistent follow-up difficult. Individuals may make the effort to become involved in a program, but upon returning to the villages will become reimmersed in a social setting with spouses or other family members who exert pressure on them to resume their past drinking patterns.

One group of alochol abusers in Kodiak is called "plaza drunks" because of their tendency to sleep and "hang out" in the plaza area of the city. Local alcoholism counselors judge this group to be confirmed alcoholics, with a minimal chance of recuperation. These people often have no consistent home, sleeping in the plaza during the summer. Some are routinely picked up by local police for violating conditions previously set by the court, including their not frequenting the plaza or places that serve alcohol. They are returned to jail, only to again repeat this pattern when released. Substance abuse counselors observe that addicts under 40 years of age usually have multiple addictions, with those over 40 having a single one. These professionals also note that those individuals who have become so addicted as to become non-functional often are over 40 and without social supports; thus their prognosis for improvement is not good.

Efforts to Control Alcohol Use

Kodiak's alcohol use patterns were put to a test in an October 2, 1984 election. Two controversial propositions were on the ballot. Proposition six, an initiative measure, called for reducing alcoholic beverage sales and/or service operating hours in Kodiak city. Under this measure liquor service establishments would have to be closed between 2 and 10 a.m. Monday through Friday, and between 2:30 and 10 a.m. on Saturdays, Sundays, and on any legal holiday. The existing state law required closure between 5 and 8 a.m. A similar proposition on the Borough ballot (proposition two) did not specify hours but requested a vote on whether the borough should have the power to regulate alcoholic beverages outside the city limits (Kodiak Daily Mirror, October 1, 1984:1).

At midnight on the Saturday prior to the election, in a surprise move, Kodiak tavern owners closed their doors. In this way the tavern owners gave their patrons a preview of what would occur should the propositions pass (Kodiak Daily Mirror, October 1, 1984:1,11). Clearly the bar owners of Kodiak were not pleased by the two propositions. Some opponents of the move to limit bar hours argued that Kodiak was not your average "8 to 5" factory town. When the fishing economy is in high production, the work can be 24 hours a day. This means people leave work at variable hours and may desire access to bars at any hour (Kodiak Daily Mirror, Oct. 1, 1984:1).

Supporters of the propositions included a group called the "Safer Kodiak Coalition." This group's efforts were full-page advertisements and leaflets in the local newspaper (Kodiak Daily Mirror, October 1, 1984:16). On the day preceding the election, there appeared to be an organized effort to marshal votes against the two propositions. A large, and unexpected, number of people appeared at the City and Borough Clerks' offices to vote by absentee ballot, stating they would be out of the area on election day. Both clerks felt this was part of an organized attempt to defeat the measures (Kodiak Daily Mirror, October 2, 1984:1). Both propositions failed by large margins (Kodiak Daily Mirror, October 2, 1984:1, and Kodiak City and Borough Clerks' records).

INTERVENTION PROGRAMS

Attempts at substance abuse relief have been on the increase in recent years. The Kodiak Council on Alcoholism (KCA) was incorporated in 1971 and was accredited in 1976. Its programs include (1) Hope House, a 30-day residential treatment facility, (2) outpatient counseling, (3) the Kodiak Alcohol Safety Action Program that screens DWIs and refers these clients either to counseling or to Alcohol Information School, (4) an Education and Information Department, and (5) an Outreach program. KCA also recently received a supplemental grant award from the State of Alaska's Office of Alcoholism and Drug Abuse in the form of a "jobs program." The funds were awarded to create jobs in the area to better enable the KCA program to meet an expected increase in substance abuse in the community resulting from the continuing economic downturn in fisheries harvests (Gorman, personal communication).

Besides KCA, the following substance abuse programs serve Kodiak: (1) an Alcoholics Anonymous (AA) program, (2) two Al-Anon groups serving friends, family, relatives, and/or significant others of alcoholics, (3) an ALATEEN group serving teenagers of alcoholic parents, friends, relatives and/or significant others, (4) a Narcotics Anonymous group, (5) an Adult Children of Alcoholics group, and (6) an alcohol program through KANA that serves the island's villages. The KANA program includes outpatient counseling, education, and an outreach program. KCA has also worked in some villages, though much less than the KANA program. Both KCA and KANA recently worked together on a joint grant proposal.

Public Assistance and Social Services

Unemployment indices can provide some insight into the effects of the fisheries' downturn. Public assistance agency personnel expected an increase in those categories that could be linked to situations surrounding the decline. It could also be expected that social service cases would increase because of the economic pressures on unemployed families and on business families suffering from the depressed economy. According to agency workers, however, the increases that did occur were not as large as anticipated. The salmon fishery for 1983, for example, was very poor in terms of numbers of fish and prices; thus an increase in public assistance applicants was expected. But the summer months of the salmon season produced few new applicants. Similarly, when news of the closure of the 1983 fall king crab fishery was announced, agency personnel prepared for a surge of business. The expected rush did not, however, immediately materialize. In the spring of 1984 the caseload did begin to increase and agency representatives hypothesize that a time lag resulted when individuals and families sought to avoid applying for welfare.

The idea of accepting public assistance is not viewed with favor by most residents in the town of Kodiak. Local fishermen are a proud and independent people who believe strongly in their own self-reliance. These values are characteristic of many fishing populations where individuals are responsible for themselves, their vessels, and the equipment. There are any number of examples that reinforce these values. Equipment failure in turbulent weather is one. When your engine fails in the midst of a storm, it is up to you, and you alone, to fix whatever is wrong and to reach a safe harbor. Another example has to do with the actual production during a given harvest; here success is viewed to a large extent as a function of hard work and self-reliance. Applying for welfare in a value scheme like this should occur only as a last resort, and would reflect deep stress. Professionals in the agencies observed that most of the fishermen who applied for public assistance were crew members; only a few boat owners were seen. Similarly, Filipino and other Asian cannery workers tried to avoid applying for public assistance, preferring to look to each other and their own community for assistance.

Agency representatives noted that applicants from fishing families were defensive about their needs for public assistance and embarrassed by the whole procedure. Such applicants "felt the bottom was falling out and they were feeling desperate." Agency personnel estimate that over the period from the first crab closure in the fall of 1983 through the second closure in 1984 their caseload increased 25 to 30 percent, and then stabilized. The stability is attributed to several causes. First is the departure of segments of the workforce. For example, agency personnel note that during the fishing season of 1982 they had a large number of applicants from the transient population in Kodiak looking for work. Many who couldn't find employment sought temporary relief through public assistance. Now the decline in the economy has resulted in fewer transients and thus fewer applications.

The State of Alaska's Division of Family and Youth Services' representative in Kodiak is responsible for protecting children and dependent adults (including the elderly) from abuse, neglect, and exploitation. When asked about the affect on his social services from the decline in the Kodiak economy, he stated there was a slight increase in the caseload. Specifically, he saw a small increase in rape and child abuse cases. However, this professional cautions that the increase could be more of a statistical artifact than an index of a real increase; more accurate reporting may have been at work rather than a larger number of crimes themselves. He urged caution when trying to draw direct correlations between economic fluctuations and changes in social service caseloads.

For example, effects in a social service area may not be felt until two or three years after the initial phase of an economic downturn. Families and individuals utilize their resources, both economic and emotional, during the initial stages of a retrenchment. Savings are spent; temporary or part-time work may be taken. Only after these resources are used up will public assistance be sought. In addition, economic development aside from fishing is now occurring in Kodiak. The current "construction boom" is offsetting some of the deleterious effects of the cut-backs in the fisheries. Of course, when the current construction projects come to an end, the economic problems may grow.

In summary, the decline in the fisheries has had a moderate effect in the area of public assistance and social services. An expected large increase in applicants for services did not come to pass; however, the economic problems in Kodiak have not all been solved and social service needs may grow in the future.

Patterns of Crime

Patterns of criminal activity have changed over the last few years, according to the Kodiak Police. They attribute these changing patterns to several causes: among them the decline in the fisheries, increased population, and in certain cases to better reporting as a result of public education and awareness. Records kept by the Kodiak Police Department for the FBI's Uniform Crime Report from 1970 through 1983 (Table 261) show an increase over time in crimes considered very severe (Part I offenses). Less severe crimes (Part II offenses) show no discernable pattern of change over this period, fluctuating yearly.

The police caution that these statistics are influenced by factors other than actual incidents of crime. For example, an increase in the number of rape cases may result from more reporting of rapes because of education and awareness than from an actual increase in incidents. Even so, the police perceive an increase in certain types of crime and of the changing patterns. They feel that the steady increase in Part I offenses is related to the fluctuations in the economy with the decline in the fisheries as well as to an increased population.

TABLE 261

Criminal Arrests
City of Kodiak: 1970-1983

Year	Part I[1] Offenses	Part II[2] Offenses	Total
1970	4	501	505
1971	1	352	353
1972	47	504	551
1973[3]	40	229	269
1974	50	503	553
1975	53	450	503
1976	91	551	642
1977	117	686	803
1978	86	611	697
1979	81	523	604
1980	120	368	488
1981	122	325	447
1982[4]	234	508	742
1983	129	441	570

[1] Part I Offenses: Criminal homicide (murder and nonnegligent manslaughter), forcible rape, robbery, aggravated assault, burglary, larceny motor vehicle theft.

[2] Part II Offenses: Other assaults, arson, forgery and counterfeiting, fraud, embezzlement, stolen property, vandalism, weapons, prostitution and commercialized vice, other sex offenses, narcotic drug laws, gambling, offenses against family and children, driving under the influence, liquor laws, drunkenness, disorderly conduct, vagrancy, all other offenses (except traffic).

[3] Incomplete data.

[4] Months reported: January-July, September-December.

SOURCE:	1970-1976, Simpson Usher Jones, 1977.
	1977-1979, State of Alaska, Criminal Justice Planning Agency, Office of the Governor.
	1980-1981, State of Alaska, Criminal Justice Planning Agency, Department of Law.
	1982-1983, State of Alaska, Department of Public Safety.

Finally, with the decline in the fisheries, there has been a decrease in the number of transients in Kodiak. During the 1970s and early 1980s the expanding fishing industry, attractive wages, relatively cheap and fast air service, and increased public attention to Alaska following the pipeline all served as a lure for the transients seeking work. A major problem the police encountered with some transients was their attitude. As one patrolman noted, "These people would do things here they would never dream of doing in their own home towns!" The visitors appeared to believe that since Alaska was the "last frontier" they should behave according to popular stereotypes of how "frontiersmen" behave. This led to such behavior as carrying guns and/or knives or committing acts of public nuisance. More recently there has been a decrease in these types of disturbances.

The failure in the fisheries has also been accompanied by a decrease in the number of prostitutes in Kodiak, or as one patrolman stated when asked about it, "No, we don't have much of a problem with prostitution anymore; they just busted her last night!"

Overall, crime in Kodiak has conformed to the principle reiterated by one of the Kodiak police officers: "As the economy goes down, crime will go up." However, as noted above, the important aspect is the changing patterns of criminal activity, i.e., the nature and content of the crimes.

Ethnic Relations

Between 1970 and 1980 the number of minority residents of Kodiak city steadily increased. Table 262 displays the composition as reported by the U.S. Census. The most notable change is in the Filipino population, which grew from less than 2 percent to over 11 percent of those counted by the census takers. These were residents, according to census definitions; the counts did not include seasonal workers brought in for summer employment. Along with the changes in composition and growth in numbers have come adjustments in inter-group relations. We have divided the discussion into three parts centered around the decade of the 1970s.

Before 1970

Kodiak Island has been inhabited for about 7,000 years (Clark 1984). The Koniag were the indigenous group when Russians arrived in 1784. Initial relations between the Russians and the Koniags were combative; the Koniags were aware of the severe treatment Alaskan Natives to the west had received at the hands of the Russians. After some initial resistance, the Koniags were subdued and organized into a force to labor for the Russians. They hunted and trapped for furs and traveled great distances to assist the Russians to expand their fur-based economic empire. The Russian subjugation and economic exploitation had a profound effect on the Koniags. Besides a dramatic population loss in absolute numbers (8,000 in 1799 to 1,729 by 1929), the indigenous culture was disrupted to the point where many traditional patterns had almost disappeared by the time of the American occupation (Payne 1980: 26-28).

TABLE 262

Ethnic Composition of Kodiak City: 1970-1980

Ethnic Group	1970[1]	1980
White	3,094	3,337
Black	44	26
American Indian	53	58
Eskimo	31	35
Aleut	479	573
Japanese	8	23
Chinese	1	1
Filipino	70	554
Korean	n/a	48
Asian Indian	n/a	0
Vietnamese	n/a	19
Hawaiian	n/a	4
Guamanian	n/a	6
Somoan	n/a	8
Other		64
TOTAL		4,756

[1] A total figure cannot be given on ethnic composition for 1970 because the sources used mixed their "other" categories.

SOURCES: 1970: Alaska Consultants 1979:396 and U.S. Department of Commerce 1973: 3-50.
1980: U.S. Department of Commerce 1982: 3-9.

Cultural Dynamics 1986

n/a = not available in the 1970 census.

After the transfer of Alaska to United States jurisdiction in 1867, the number of ethnic groups present in Kodiak grew in number. For example, in addition to varied Euro-Americans who came to the island, Chinese came seasonally to work in the fish canneries (Liljeblad 1978a, Moser 1899 and Porter 1893). After the turn of the century, Filipinos began to replace the Chinese in the canning crews. This came about to some extent as a consequence of the Chinese Exclusion Law of the late nineteenth century. By the 1930s the Filipinos dominated the cannery crews in Alaska both in terms of numbers and in terms of controlling the contracting agencies that sent cannery crews to the state each year (The Anchorage Times, April 7, 1985:K-1, K-4, and Lilejblad 1978b). Their dominance of cannery labor continues to the present.

The 1970s

The Alaska Native Claims Settlement Act (ANCSA) is a watershed in Native/non-Native relations. Prejudice and discrimination against Alaska Natives existed prior to ANCSA's passage in December 1971. In the Kodiak area, the Act apparently increased non-Native resentment of the Koniag. The main sources of this animosity were the benefits Natives were perceived as receiving and a fear of loss of privileges by non-Natives. In the former case, for example, it was believed that Natives would receive large amounts of money; in the latter instance, some non-Natives were worried about loss of access to their favorite hunting and fishing spots. ANCSA institutionalized political and economic power in Native corporations. Some non-Natives resisted the expression of this newly emerging power. Though the more overt protestations have decreased in the years following the passage of ANCSA, some lingering prejudice still exists. This was reflected in references by some whites to setbacks in the Native corporations.

As the fishing industry expanded in the 1970s, the number of Filipinos coming to Kodiak grew. Though fewer than the Filipinos, groups of Mexicans, Koreans, and Vietnamese also began arriving in increasing numbers to work in the canneries. The growth was not without an increase in tension between the various ethnic groups. To many white residents, the Filipinos were viewed as a tightly knit group with a potential for violence and trouble. An illustration is the attitude some individuals expressed about residency practices. Some Filipinos bought homes and then rented rooms to friends and relatives. In a few cases occupancy eventually was far greater than expected by "normative" Euro-American standards. These living arrangements were viewed as evidence of Filipino clannishness and unwillingness to commit to the Kodiak community. However, given the difficulty of home purchase and the extremely limited housing and rental market in the town during the fishing boom, a Filipino had little choice of residence; many had to adapt as best they could. The Filipinos, like many other itinerant cannery laborers, were needed for fish processing but often were denied the facilities and amenities necessary for a "normal" life. This treatment reflects Kodiak's ambivalence towards this group of workers.

In reality, the Filipinos were not a homogenous group. Some were long-time residents of Kodiak, others had come from other parts of Alaska or from other states (mainly on the west coast), and some came directly from the Philippines. There were differences in socioeconomic background. Filipinos interviewed in Kodiak for this study were quick to point out and take pride in the fact that a large percentage of recent emigrees were professional people with advanced educations who could not get jobs in the Philippines. These migrants brought to Kodiak the regional, cultural and ethnic diversity of the Philippine Islands themselves.

Relations in the 1970s were at their worst at the end of the decade. Causative factors were complicated, however, and it is difficult to say that the events were wholly related to racial or ethnic conflicts. For example, the diversity within the Philippine Islands themselves led to traditional animosities being carried to Kodiak and erupting between Filipinos. Potential job displacement by newly arrived workers increased tensions between the ethnic groups. Then there were conflicts between young, single males of different ethnic groups over territory such as bar space and females.

Leaders of the various groups sought ways to ameliorate the tensions. The pride the Filipinos take in their custom of looking after one another spurred their participation. Their reputation as diligent and reliable workers also gave credence to their efforts. An organization called the Filipino Community of Kodiak Alaska was formed to improve ethnic relations and solve other problems specific to the Filipino community. At the same time the Multicultural Forum Council brought together the different groups in Kodiak so they could learn to appreciate their differences and similarities.

However, racial tensions continued to smolder and finally erupted in July 1980 with the fatal stabbing of a white fisherman by a Filipino. This incident evoked open expression of prejudices heretofore held back. Several members of the Filipino community received threatening phone calls, while others were harrassed on the streets. Car windshields were smashed and homemade bombs thrown at Filipino homes. Filipino residents were frightened and many were confused; they did not comprehend why the entire Filipino community was being subjected to condemnation because of an act involving only one individual. Some Filipinos were so alarmed they began not to show up for work and those that did were escorted home by police. The police doubled their force to maintain the peace (Kodiak Daily Mirror, July 24, 1980:1-2).

After 1980

Despite the infrequent overt incidents like the one just cited, and continuing subtle discrimination, the prospects brightened for Filipinos and other minority groups in Kodiak as time progressed. Diversification in the fisheries meant more dependable work rather than just the seasonal employment in the summers. Also, as the Kodiak economy grew from the prosperity of the fisheries, jobs in other sectors began to become available to the Filipinos and other seasonal employees. Eventually more Filipinos began purchasing homes with the plan of living permanently in Kodiak.

Somewhat surprisingly, ethnic relations have improved with the recent decline in the fishing economy. The cause, however, appears not to be improved tolerance or understanding but out-migration. Without permanent work the developing populations of Filipinos, Vietnamese, and Koreans could not survive in Kodiak and were forced to leave. The out-migration had an effect on the fish processors who were trying to build up a year-round work force. Without a reliable labor pool the processors could not develop the winter fisheries, so they were struggling to provide what they considered their "core" group of laborers enough steady work to keep them residing in the area. The awareness of the value of ethnic minorities, like the resident Filipino population, to the survival of Kodiak's fishing industry should serve to ease inter-group tensions.

Another aspect is a growing awareness of that a large percentage of the minorities are U.S. citizens. Citizenship can translate into voting power and local politicians are sensitive to this fact. Furthermore, with an increase of home ownership and investment in the business community, ethnic minorities develop vested interests in a community. Finally, as employment opportunities expand in sectors of the economy other than fisheries, individuals get better known to other local residents. At present according to Kodiak residents close to these matters, inter-group relations are considered good, with few current problems.

Political Responses

One response to the fisheries decline has been the pursuit of political action. This has come about mainly through special interest organizations related to the industry. The most visible and dramatic action has been the formation of a new organization called the Alaska Coastal Community Alliance (ACCA). In early 1985 the group was in the process of becoming incorporated. The unifying theme of ACCA is its members' belief "that a fishing community's economic health depends on its fishing fleet's fiscal stability, which is dependent on its flexibility and ability to accommodate" to the fluctuating conditions of natural cycles, fishing effort, resource management, and individual species abundance (Alaska Coastal Community Alliance, n.d.).

The Alliance has adopted a position in support of a policy that allows fishermen maximum flexibility (the key word) in pursuing various species in different locations at different times. The group is opposed to management schemes, referred to as "effort management mechanisms" (such as license limitations, share-quota, and bid-share systems) that they feel are concerned not with resource conservation but only with resource allocation. The group favors traditional management systems that support an open fishery. Thus they prefer practices such as the regulation of season time, opening length, size and sex restrictions, gear limitations, and area quotas, and believe the "natural economic needs of fishing vessels as businesses will provide fishing effort control when necessary" (Alaska Coastal Community Alliance, n.d.).

Members of the Alliance indicate that their position stems directly from the decline of the fisheries. In order to survive economically, when the crab resources were no longer available, fishermen switched to harvesting other species. Then the possibility of limiting entry into the halibut fishery was raised. If this were to occur it would constrict the fishermen's flexibility to diversify from fishery to fishery as conditions and needs warranted, as exemplified by the crab to halibut switch. The threat of limiting entry into the halibut fishery was the final impetus for the organization of ACCA.

The goals of the Alaska Coastal Community Alliance are as follows:

- To insure the conservation of Alaska's resources while stimulating the sensible development of all business dependent upon them.

- To inform the public of issues affecting our communities.

- To insure that consistently high quality of seafood reaches an ever-expanding market.

- To insure open access to fisheries resources.

- To improve the economic viability of Alaskan coastal communities (Alaska Coastal Community Alliance, n.d.).

The ACCA is open to all individuals with an interest in the fishing industry who subscribe to these goals. Leaders hope to expand to other coastal communities once the group is established in Kodiak. There is a feeling once ACCA is solidified and begins to move to implement its philosophy that it will be a strong and effective political force both for the fishing industry and for Alaskan coastal communities.

A second politically significant organization is the Kodiak Fishermen's Wives Association. Though not as visible nor as frequently mentioned as others, this group is especially effective in monitoring fishery concerns and implementing political action relating to these concerns. Organized in 1967, the stated purposes of the non-profit association are:

- To support and assist the United Fisherman's Marketing Association and the Shrimp Trawler's Association, and in no way publicly oppose any stand taken by them.

- Continued support and effort to curtail encroachment of foreign fisheries off our shores.

- Continued support of our Congressmen fighting for legislation beneficial to all fishermen.

- Continued efforts for upgrading the position of the American fishermen, and to promote good public relations.

- Continued effort to promote the sales of the fishery product.

- To support and/or assist in community projects (Kodiak Fishermen's Wives Auxiliary, 1981:i).

Some of the actions taken by this group in support of the fishery and the community include:

- Donated oxygen tanks to the ambulance service and to the hospital.

- Provided clothing, food, and shelter to individuals who survived the sinking of their vessels.

- Donated start-up money to ACCA.

- Sent women representatives to fisheries management meetings to observe and gather information.

- Conducted memorial services for fishermen lost at sea.
- Provided support for a woman who lost a husband and two brothers at sea.
- Attempted to get fish education programs implemented into schools and the community.
- Held fund-raising events and published a cookbook.

It would be naive to categorize this association as strictly a service organization, or to underestimate the members' knowledge of the fishery and their ability to participate in direct political action. For example, at one of the organization's meetings the following subjects were covered: insurance, fisheries-related conferences, lobbying about limited entry, getting more fish into school lunch programs, fisheries meetings, and ACCA. The members pride themselves in their organizational abilities and have adopted a stance of action on the issues with which they are concerned.

Two factors are central to the political prowess of the Kodiak Fishermen's Wives Association. First is the education and organizational experience of the members; second is their background in and knowledge of fishing. The latter is particularly important. Members have a vested interest in a family fishing business and they are frequently involved in its oversight. But more importantly, many have directly participated in fishing operations; they know the work involved and are able to articulate the experience into policy issues. These in turn can be translated into direct and indirect political actions. The Association expects to play an important role in improving the current economic situation. In addition, they see themselves as critical in providing a support network for fishing families during economically hazardous times. The effects of the downturn on families are understood by the Association members who thus are able to give necessary and empathetic support when needed. In this way the group is serving to support the social fabric during these hard times.

Two powerful and well known fishermen's organizations in Kodiak are the United Fishermen's Marketing Association (UFMA) and the Alaska Draggers' Association (ADA). These organizations are not unions, but rather marketing associations composed of independent businessmen. Though not restricted to any particular species, each organization is composed of fishermen with a common interest in harvesting a certain fish. Thus the UFMA is primarily composed of salmon and crab fishermen, while the ADA is composed of shrimp and other bottomfishermen.

The membership of the UFMA swelled during the surge of the king crab industry in the late 1970s and early 1980s. But it has declined since the demise of that industry, dropping back to a level almost identical to the pre-boom days. One accommodation the UFMA has made to the decline has been to adjust its dues and assessment structure to place less strain on the fishermen. The primary function of the UFMA is to negotiate with the processors over the price the fishermen will receive for their product. A second, and in this context, most important function is to lobby for legislation and specific regulations that apply to Alaskan fisheries. The UFMA holds seats and positions on several significant statewide fisheries organizations. It also supports candidates who support its positions.

Where the UFMA has been losing members, the Alaska Draggers' Association has been growing in size. Originally a shrimpers group, the ADA has been converting to a bottomfish organization as production opportunities have expanded in this sector. Since the passage of the Fisheries Conservation and Management Act, both shrimpers and crabbers have been converting to bottomfishing. About half of the ADA's membership have entered joint venture operations. Besides attracting supporters from the shrimp and crab industries, the ADA is also gaining members statewide. With a broader base of membership, its political strength should grow. As with UFMA, the ADA is involved in political action at all levels to further its goals.

Yet another organization that has gained in strength since the decline in the crab and shrimp fisheries is the Kodiak Halibut Fisheries Association (KHFA). As more fishermen began to harvest halibut, the number of members in this organization grew. Awareness of issues pertaining to the halibut fishery increased; the most significant one at this point is limited entry. KHFA members are adamantly opposed to it. In addition to seeking to assure open fisheries in order to protect what they see as the individual fishermen's flexibility to enter different harvests, the KHFA is concerned about the incidental catch of foreign drag fleets, quality control, local management, increased allotments, and short seasons distributed over the years.

A final interest group found in the harvesting sector is the Olga Bay Setnetters Association. Their members represent a number of setnetters on the island.

Some of the processing workers are represented by the Alaska Fishermen's Union. This union has lost strength over the last few years and is found in only a few canneries at present. Even so, AFU workers went on strike on July 25, 1985, the first strike against Kodiak King Crab in ten years. The workers are protesting certain hiring procedures and conditions of acquiring health insurance (Anchorage Daily news, July 27, 1985: B-7).

RECENT ADJUSTMENTS

Three trends appear to be emerging in Kodiak's political arena. One is the more active participation of the city and the borough in fisheries issues. According to long-time residents, it is a new phenomenon for the local governments to take stands on these matters; in the past these entities did not address fisheries directly.

A second trend involves factionalism, where one segment of the fishing industry is battling against another. Though there appears to be some concerted action by different groups in Kodiak to develop unified political action to deal with the decline in the fisheries, some factionalism is nevertheless occurring. According to one observer, in years past political battles fell mainly into two areas: the fishermen versus the processors, and the cannery workers versus the processors. This was the traditional "labor versus management" and/or the price dispute disagreement characteristic of the Alaskan fishing industry. However, according to the same observer, the situation today is more complex. "A few years ago you didn't have to be so political, now you can't turn your back. Everyone views everyone else as an enemy."

This informant sees in Kodiak today a number of groups in opposition to one another. Among those noted in the processing sector are joint ventures versus land-based processors, overall Japanese interests versus overall American interests, and Japanese-owned land-based processors versus American-owned land-based processors (see for example Anchorage Daily News May 2, 1985: D-1 and Anchorage Daily News Aug. 9, 1985: C-7). Among the groups in the harvesting sector that seem to be in opposition are black cod longliners versus black cod pot fishermen versus black cod trawl fishermen; yellow-fin sole trawlers versus crab fishermen (Anchorage Daily News, July 18, 1985: D-1); and Japanese salmon fishermen versus American salmon fishermen (Anchorage Daily News, August 15, 1985: D-1). If this factionalism is in fact pitting certain segments of Kodiak against other segments, then it is contrary to the traditional political battle lines in Kodiak. According to several observers of the political scene, "Historically if Kodiakers were not fighting each other they were fighting someone else. But they would unify against a common enemy." If the recent change reflects increased conflict, then perhaps a narrowing and specialization of political interests is taking place.

The final trend that some residents feel may be emerging is related to the above point about the process of implementing the goals of specific factions. The speculation is that the situation in the fisheries is fast approaching a "Judge Bolt Decision" remedy to the conflicts and factional disputes. This means that specific fishery's interests are turning to political representatives for legislative solutions, or to the courts for judicial implementation of their points of view. While such tactics are nothing new--both have certainly been used in the past--local observers perceive a larger number of such actions. Both the quantity and quality of the legislative tactics and judicial appeals is perceived as intensifying.

Summary

What were the impacts of the decline in Kodiak's fisheries? We have described selected ones important to the fishing sector of the town's life. The economic slump affected families in different ways. Strains in relations were felt by many as vessels lost their value, fisheries were closed, and families had to change their lifestyles. Some moved from Kodiak to try fishing elsewhere; some quit fishing altogether. Others tightened their belts and persevered.

Divorces, domestic violence, alcohol and drug abuse, and mental health problems have all increased. While no clear-cut causal link between the economic downturn and these increases can be demonstrated, professional workers in the town of Kodiak agree that there is a link. According to the professionals, changes in the patterns of these behaviors are more important than the increases.

Many fishermen have turned to political action to seek remedies for the economic difficulties. Several different organizations representing fishing interests are attempting to present a united front in seeking solutions, although some factionalism is occurring between the various interests. The city of Kodiak and the borough are actively involved in fishing issues, a new trend for these groups. The end result of the legal and political actions was not evident when this report was being prepared.

IX. SUMMARY

This volume is a compendium of seven studies bringing together basic descriptive data on a broad range of topics dealing with a major coastal region of Alaska: the Kodiak-Shumagin area of the Central North Pacific. Each chapter addresses socioeconomic subject matter important to the region and to the state of Alaska. The time span examined is the 1970s to mid-1980s, a period of rapid growth and subsequent collapse of some key fisheries resources. By examining the "boom and bust" cycle of these years, a parallel could be constructed for future investigation of the effects of outer continental shelf (OCS) oil and gas development activities. Major themes underlying the research are change in the social and economic framework of the people living in the regional city, Kodiak (and incidentally the enclave community of Cold Bay), and alterations in the unique economic patterns characteristic of the eleven smaller Koniag communities on Kodiak Island and the Alaska Peninsula.

In recent years, the region has been subject to far-reaching modifications in several elements of its economy. Among these were the decline in the fishing sector, especially a precipitous drop in the crab resources, difficulties in developing bottomfishing capabilities; counterbalanced by a large infusion of state monies. Cold Bay has not been affected by these forces. It is an enclave community, occupied primarily by transient technical personnel, that services transportation and communication to and from the Aleutian Islands chain, and thus is essentially removed from the Kodiak-Shumagin regional economy. The following summarizes our findings.

COMMERCIAL FISHING

The fisheries of the Kodiak and Chignik regions include a great variety of finfish and shellfish; in general, the same kinds of resources are found in the two regions. Important finfish species are salmon (five species), herring, halibut, sablefish, and Pacific cod. These species generally increased in abundance from relatively low levels in 1975 to relatively high levels in 1983. Other finfish important to non-Kodiak American and foreign fishermen include pollock, which peaked in abundance in the Shelikof Strait spawning area in 1984 and has since declined dramatically. Shellfish species of recent commercial importance in the two regions include king crab, tanner crab, dungeness crab, and shrimp; minor contributions have come from scallops and razor clams. King crab have declined precipitously since 1981. Tanner crab increased substantially in the early 1980s and dungeness crab are thought to have remained stable. Shrimp populations have not recovered from their reduction in the mid-1970s to low levels of abundance.

The harvesting sector of the Kodiak commercial fisheries industry underwent extensive transformation during the study period, whereas the Chignik harvesting sector remained relatively unchanged. The value of the fisheries in the Kodiak region increased dramatically from 1975 to 1981 as a result of the prices for crab, but then declined as the king crab stocks nearly disappeared. Tanner crab, halibut, sablefish and groundfish have assumed increasing importance to Kodiak fishermen, while king crab, shrimp, and, to a lesser extent, salmon have declined in importance. In non-inflation adjusted dollars, the total value of fisheries in the Kodiak region was $106.2 million in 1981 and $50.4 million in 1983. Chignik region fishermen remained primarily salmon harvesters, with little diversification into other fisheries during the period from 1975 to 1984. The value of the fisheries of the Chignik region fluctuated between $15 million and $25 million, with salmon providing about two-thirds of the value.

The processing sector has had to make major adjustments because of the changing market conditions and species abundance. A number of American firms traditionally involved in salmon and crab processing have gone out of business. This substantially reduced employment levels in processing. Japanese firms have become major or part owners of most of the remaining plants in the Kodiak area. Processing has been consolidated into Kodiak city with outlying facilities serving only as maintenance stations. Since 1983, Kodiak firms have made an effort to diversify by entering into production of quality groundfish products such as cod, sole, and sablefish. In 1984 a line for producing surimi from pollock was opened and there were plans for expanding surimi production in the future.

Kodiak area communities and their resident fishermen have been in a state of constant adjustment to the rapidly changing fisheries resources. The number of fishermen in Kodiak city increased from 396 in 1975 to 812 in 1981 before falling to 626 in 1983. The number of rural Kodiak fishermen followed a similar curve although declines in participation were sharper in some communities (Akhiok, Karluk, Larsen Bay). Vessel loans at low interest rates from the State of Alaska underwrote substantial expansion in the size and number of vessels from 1975 to 1980. During the study period, average gross earnings of Kodiak city fishermen peaked in 1978 at $129,900, but fell to $69,600 in 1983. Average gross earnings of rural Kodiak fishermen were less than half that of Kodiak city fishermen.

In the Chignik region, change was slower since salmon are the most important species to the area and the limited number of permits does not allow additional fishermen to enter the salmon fishery. High earnings in the late 1970s and early 1980s allowed the purchase of newer and larger vessels for salmon, but little diversification occurred into the other fisheries. Average gross earnings for Chignik boatowners averaged over $120,000 during the 1980s.

SUBSISTENCE ACTIVITIES

Substantial subsistence activities are characteristic of all communities in the study area. Major species of importance are salmon, halibut, and deer in the Kodiak region, and salmon, caribou, moose, and halibut in the Chignik region. The average per-household subsistence harvest of Kodiak rural villages is 1,611 pounds, of which 83 percent is marine and 17 percent terrestial. For the road-connected area of Kodiak Island, the figures are 460 pounds per household with 84 percent marine and 16 percent terrestrial. Kodiak villages are characterized by higher harvest levels, higher proportions of households participating, a wider variety of species taken, and greater quantities of distribution than are the road-connected communities of Kodiak Island. Salmon permit data indicate a rapid rise in total subsistence harvests over the past five years, which has been accomplished by a greater number of households taking smaller quantities of salmon.

In the Chignik region, subsistence patterns are similar to the Kodiak rural villages. However, there is wider variance in per-household subsistence harvests than in the Kodiak villages. The village of Chignik Lake has a substantially higher subsistence harvest level than any Kodiak village, while Chignik and Chignik Lagoon have lower subsistence harvests than any Kodiak village.

ECONOMIC CHANGE IN THE KODIAK-SHUMAGIN REGION

This chapter examines economic change in the Kodiak-Shumagin region from 1970 through 1983. At this time the economy experienced relatively rapid growth as a result of increased fishing production and an expansion of federal and state government expenditures. The economic change during this period was examined because we felt it was similar to the type of change Kodiak might experience with OCS development.

Economic change is described in terms of the relations between sectors of the economy. For small places, the major forces bringing change originate outside the region. The major external forces during this period were increased external purchases of the region's fishing and tourist resources and the increased expenditure of state and federal governments in the region. Employment in these external sectors expanded by almost 40 percent during the period; incomes earned expanded even more. The importance of government activity increased throughout the period, especially in the small communities.

Responses to the externally generated activity were measured in the local support sector and the household sector. The support sector expanded more rapidly than the external sector; between 1975 and 1980 the multiplier increased by over 20 percent. This response was a result of an increase in the size of the market. The local support sector is relatively highly developed in Kodiak city, but is immature in the small communities in the region. The household sector responded in two ways. First, residents expanded their participation in the market economy. Labor force participation rose across the region. Second, the region experienced an increase in immigration. While net migration was negative for most smaller communities, the percent of recent immigrants in the population was greater in 1980 than in 1970 in all but two communities.

This analysis is meant to suggest a possible pattern of response to OCS development. If we assume the economies of the region would respond to OCS development in a fashion similar to that found in this period, then OCS development would result in an expansion of support sector employment, which most likely would be more than proportional to the level of OCS activity. In addition, we would expect residents to take OCS jobs as well as non-resident labor to migrate into the region.

The importance of this similarity assumption suggests that before this analysis can be used to project the effects of OCS development, its validity should be examined. To do this, three questions relating OCS development to past patterns of change should be asked. First, in what ways is OCS development similar and different from past external sources of change? By isolating the past forces at work and comparing OCS we can assess the similarities and differences. Second, how will OCS development interact with existing external sources of change? Finally, we must ask whether past patterns and relationships will continue. This is necessary since OCS effects will depend on what underlying economic structure exists when OCS development takes place. The level of activity in other export sectors and the structure of the local economy will influence the local response to OCS development.

PUBLIC SECTOR INFLUENCE

Public sector expenditures and activities are a crucial element of the Kodiak-Shumagin regional economy. This chapter describes the major components of the economic impact of government in the region. To our knowledge, no equivalently detailed and comprehensive study of public expenditures in a region of Alaska has been undertaken. Data are not routinely kept by location, and thus, although there is rich detail on specific government programs, the totals are incomplete.

Despite data inadequacies, the summary information for 1983 gives a measure of the relative level of public sector spending in the study region. State expenditures in FY83 were at or near their peak in real terms, and thus provide a benchmark with which to compare future changes in the state role in the region's economy. Together, identified state and federal expenditures in the region (including Cold Bay) totaled close to $127 million for FY83. This number can be viewed as a conservative estimate since data availability tended to result in exclusions rather than additions. These funds were largely generated outside the study region and thus serve as an injection to the local economy. State taxes were minimal; however, 1982 federal individual income taxes paid by returns to Kodiak were approximately $19.3 million. These taxes represent a leakage from the economy.

The state/federal split of expenditures was 51 percent state and 49 percent federal, with federal spending related predominantly to the Coast Guard base. If federal activity in Cold Bay and the East Alaska Peninsula villages were more fully accounted for, the balance would likely tip in favor of the federal contribution. Assuming the retention of the Coast Guard installation, federal activity in the region can be expected to be somewhat more stable than state spending over the next few years. Although more stable, federal activities also have a smaller impact on the local economy because of leakages associated with on-base purchases and housing options for Coast Guard personnel.

The total of $127 million of identified state and federal expenditures in the region in one year gives a sense of the magnitude and importance of public sector activity to the regional economy. Any analysis of future economic trends in the region must carefully consider the impact of a changing level of government spending.

OUTDOOR RECREATION AND TOURISM

Outdoor recreation is clearly a significant aspect of everyday life in the Kodiak-Shumagin region; and tourism is an expanding part of the local economy. Outdoor activities pose important quality of life issues; a review of the available data indicated that residents place a high value on the caliber of the available opportunities. Residents perceived several conflicts surrounding recreation, including access to recreation areas, protection of fish and wildlife, and habitat deterioration.

Much of the land in the study area is federally managed, primarily as wildlife refuges. Agency management plans, mandated by federal law, were scheduled for completion in 1986. The policies established by these plans and the regulations implementing them will influence most of the popular outdoor activities: sport fishing, hunting, sightseeing, and hiking and camping. The Alaska Fish and Game Department's management practices, along with those of the Alaska State Parks, also impinge on outdoor recreation in the region.

An important aspect of both outdoor recreation and tourism are the economic benefits that they provide within the region. Unfortunately, disaggregated data that clearly reflects these benefits was not available. The best estimates suggested that one-quarter of the sales, wages, and employment in the town of Kodiak were generated from outdoor recreation and nonresident tourism. A lack of consistent baseline data, differing methodologies, and the lack of longitudinal studies were additional limitations to a review of the effects of tourism and recreation.

INFRASTRUCTURE INVESTMENT

Over the decade examined in this study, investment in public and private infrastructure in the town of Kodiak proceeded at rates significantly above historic levels. Aside from the rebuilding that took place after the 1964 earthquake, the 1970s and early 1980s marked extensive changes in the physical capital of the Kodiak economy. The major public projects were the Terror Lake Power Project, Near Island Bridge, Dog Bay Boat Harbor, and expansion of the water and sewer system; all will have significant effects on the future development of the Kodiak city economy.

During the study period, the private economy underwent a maturation process, and in all probability, it will continue to be much more competitive in most of its consumer sectors. A major impact of private construction investment was in housing, a difficult sector to measure. Except for 1983 when the Terror Lake project was at its height, construction employment between 1970 and 1984 averaged about 5% of the labor force. Highly seasonal in the earlier years, employment patterns moderated over the period.

The growth of both the private and public infrastructure primarily came from the economic expansion of state spending supported by oil revenues, and the fishing income that resulted from the good harvests and high prices of salmon and crab in the late 1970s and early 1980s. Employment that resulted from public investment expenditures had relatively small effects. The larger the project the smaller was the proportion of local residents who were employed. This stems from the composition of skills available in the resident population.

Although data providing details are sparse, living costs are recognized to be higher in places like the Kodiak/Shumagin region than in urban areas like Anchorage and Seattle. The magnitude and rates of change in these differences are influenced by forces such as an increase in the size of the market, economies of scale, and reduction of transportation costs. All of these took place in Kodiak during the study period. It is not possible to specify the consequences for the cost of living, however.

KODIAK CITY SOCIOCULTURAL SYSTEMS

The mid-1970s through the mid-1980s marked a typical Alaskan boom and bust pattern for the city of Kodiak. The build-up and subsequent deterioration of the region's fishing economy had many ramifications for the sociocultural systems of the community. Earlier problems, such as the lack of harbor space, inflation, and a housing shortage, were overshadowed by the declining economy. In the fishing sector, concerns emerged over loss of income, repossession of vessels, rapidly escalating insurance rates, the availability of trained crew members, and safety. Some fishermen turned to alternatives, such as harvesting bottomfish and halibut. However, converting to these fisheries posed additional problems.

The processing sector sought to adapt by diversifying, although several plants have either shut down or gone out of business completely. Foreign investments and joint ventures complicated the situation. The major concerns of the processors were overcoming the difficulties inherent in diversification, maintaining a stable workforce, and obtaining a consistent supply of fish. Community attitudes toward OCS development in nearby waters were changing. During the boom period, strong opposition was expressed to any offshore petroleum activities. At the time of this study (1984-85), the attitude was one of accommodation and interest in these activities. This was a major change for the residents of Kodiak and the industries involved.

The economic changes have impacted families in different ways; fishing families were the most seriously effected. Strains in relations were felt by many as vessels lost their value, fisheries were closed, and families had to change their lifestyles. Some moved from Kodiak to try fishing elsewhere; some quit altogether. Others tightened their belts and persevered. Divorces, domestic violence, alcohol and drug abuse, and mental health problems all increased. While no clear-cut casual connection between the economic downturn and these increases can be demonstrated, professional workers in the town of Kodiak agree that such a link exists. According to the professionals, changes in the patterns of behavior are more important than the increases; alterations in the patterns are emphasized because, these workers contend, statistical compilations do not reveal the full scope of the changes. Further, these professionals warn of a lag time between the economic downturn itself and the manifestation of problems.

Many fishermen have turned to political action to seek remedies for the economic difficulties. Several organizations representing fishing interests are attempting to present a united front in seeking solutions, although some factionalism is occurring between the various interests. The city of Kodiak and the Kodiak Island Borough are actively involved in fishing issues, a new trend for these groups. The end result of the legal and political actions was not evident when this report was being prepared.

Concluding Note

All of the communities in the study area have primary links to resources of the North Pacific, although these linkages are manifest in different ways. To varying degrees, each community is dependent on both commercial fishing and subsistence production, much of which is from the ocean. Diversification of the economy also is occurring. For example, tourism and recreation are playing an increasingly important part in the local economy. As regional center, Kodiak city is the home of many fishermen. It is the major processing port in the north central Pacific Ocean, and is the regional headquarters for several state agencies. Among the significant recent changes in the town's economy are some substantial additions to the community's infrastructure from state capital funding. Illustrations include the recently constructed Dog Bay Boat Harbor, major construction and reconstruction at the Coast Guard Base, and a bridge to Near Island. The declines in the fishing industry have had consequences for the community's social health. We have sought to document changes in categories such as alcoholism, mental health, crime, health care, welfare, social services, and family relations. The increasing importance of political action on behalf of fishing interests is also discussed.

Not all segments of the social and economic systems of the region equally experienced the fisheries boom of the 1970s. Nor were all sectors affected by the bust in the crab fisheries in the early 1980s. The events in the fisheries were felt most directly by fishermen, processors, and their employees. Likewise, the boom from government funded projects was not equally distributed throughout the regional economy. The benefits were most enjoyed by the workers who built the projects and the sectors supporting these activities. Now it is likely that the region as a whole will feel the ramifications of the decline in state largess typifying the late 1980s. The diversification of the economy documented here along with the long-standing resilience of the area's citizenry, should accomodate to these changes.

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Appendix A

Capital Appropriations History

General Notes:

Amounts shown are appropriations, not expenditures. Projects may not have been undertaken in all cases. Expenditures do not necessarily occur in the same fiscal year as the appropriation is made.

SOURCES: Election District Report of the Free Conference Committee, Operating and Capital budget, Legislative Affairs Agency, FY 78 - FY 85 (EDR).

Department of Community and Regional Affairs, Grant Histories, Current Project Reports (CRA).

Department of Transportation and Public Facilities, Project Listings, (DOT).

Bristol Bay Native Corporation, "Status of Capital Improvement Projects" (BBNC).

Kodiak - Highways

FY	Project	Amount ($000)	Source
85	Mission Road	340.0	EDR
85	Near Is. Bridge Phase II	14,500.0	
85	Monashka Circle-Bayview	750.0	
85	Selief Lane Extension	2,149.0	
84	Bell Flats Road	400.0	
84	Muni Bldg Docks/Harbor	300.0	
84	Anton Larsen Road Realign	1,000.0	
84	Mission Road Construction	1,000.0	
84	Mt. View Dr. Road Imp.	340.0	
84	Sidewalk on Mill Bay Road	70.0	
84	Pedestrian Safeway-Otmiloi	470.0	
84	Mill Bay Road	400.0	
84	Baranof Street	1,148.0	
84	Lilly Drive & Woody Way	923.0	
83	Pedestrian Safeway	200.0	
83	Near Island Bridge	3,000.0	
82	Otmiloi Road Resurface	800.0	
82	Bells Flat Road Resurface	805.0	
82	Kodiak Traffic Signal Systems	402.5	
82	Pedestrian Overpass Study	100.0	
82	Mill Bay Road Paving	747.0	
82	Anton Larsen Bay Realign	110.0	
82	Mission Road Improvements	550.0	
81	Spruce Cape-Mission Road	335.0	
81	Near Island Bridge	5,000.0	
81	Kodiak Paving	1,395.0	
80	Sheilikof Avenue Improvements	310.0	
80	Bells Flat Road Improvements	780.0	
80	Otmiloi Road Improvements	1,500.0	
80	Overhead Crosswalk	200.0	
80	Near Island Bridge	500.0	
80	Shelikof Avenue Improvements	310.0	
80	Mill Bay Road Walks	200.0	
	TOTAL	41,034.50	

NOTE: Amounts shown are appropriations, not expenditures. Most of these appropriations were made to the Department of Transportation and Public Facilities. A few projects were designated as Grants to Municipalities.

Cultural Dynamics

Kodiak - Aviation

FY	Project	Amount ($000)	Source
83	Airport improvements	430.0	EDR
81	Kodiak Air Carrier Apron Expans	2,160.0	EDR
	Total	2,590.0	

Kodiak City - Ports & Harbors

FY	Project	Amount ($000)	Source
85	Dog Bay Harbor Upgrade	1,000.0	EDR
84	Dog Bay Breakwater	750.0	│
83	Dog Bay Boat Harbor	500.0	│
82	Kodiak Harbor Upgrade & Maint.	490.0	│
82	Harbormaster Bldg. Exp.	100.0	│
82	Pier II & Warehouse Repair	350.0	│
81	Kodiak Ferry Terminal	2,790.0	│
81	Kodiak Near Island Harbor GO Bons	2,000.0	│
80	Near Island Harbor	500.0	│
80	Kodiak Harbor Electrification	400.0	│
79	Small Boat Harbor Development (GO Bonds)	2,500.0	
	TOTAL	11,380.0	

DOT Lists $1,114,400 in 1980 for harbor--not listed above.

Cultural Dynamics

Kodiak City - Water/Sewer/Solid Waste

FY	Project	Amount ($000)	Source
85	Solid Waste Facility	2,600.0	EDR
84	Ismailov St./9th Ave. Water	300.0	
84	Sewage Plant Upgrade	300.0	
84	Water/Sewer Phase II	2,125.0	
84	Marine Way Waterline	34.8	
84	Near Island Water & Sewer Dev.	350.0	
83	Water/Sewer	1,143.8	
83	Marine Way Waterline	284.2	
82	Comprehensive Water Study	140.0	
80	Monashka Bay Dam Reconst.	200.0	
	TOTAL	7,477.8	

Kodiak City - Community Facilities

FY	Project	Amount ($000)	Source
85	Baranof Museum Improvement	75.0	EDR
85	Senior Center Construction	1,600.0	
85	KMXT-New Facility A & E	25.0	
84	KMXT-Equipment	43.0	
84	Senior Center Design	40.0	
83	Muni Bldg/Museum Improvements	125.0	
83	Senior Center Land	150.0	
82	Ambulance	40.0	
82	Per Capita Entitlement	3,769.1	
80	Library, Children's Wing	300.0	
80	St. Herman's Russian Orthodox Mus.	350.0	
80	Baranof Museum Heating System	25.0	
80	Year-round Legislative Info. Center	25.0	
79	Kodiak Museum Renovation	8.5	
79	St. Herman Shrine	250.0	
78	Mini TV	20.0	
	TOTAL	6,845.6	

NOTE: These appropriations were made to the Department of Administration, Department of Education, or as Municipal Grants. Per capita entitlement is included here, although it could be used for a variety of projects as determined locally.

Kodiak City - Public Safety

FY	Project	Amount ($000)	Source
85	Aircraft Engine Replacement	525.3	EDR
84	Jail Addition	400.0	
84	Police Dogs	25.0	
82	Jail Facility	850.0	
82	Firehall Traffic Light	80.5	
82	Kodiak Court Remodel	238.1	
80	Contract Jail Services	35.0	
	TOTAL	2,153.9	

Kodiak - Fish and Wildlife

FY	Project	Amount ($000)	Source
84	F/W Enforcement Warehouse	99.9	EDR
82	Fisheries Enhancement - Terror Lake Hatchery	50.0	
82	F & G Resources - 2 Gruman Navigation Systems	50.0	
81	Western Seas Patrol Vessel (GO Bonds)	4,218.8	
79	Kodiak Shellfish Pots	36.0	
78	CC Seafood Proc. Lab Equip.	100.0	
78	Kitoi Bay Hatchery Repairs	200.0	
	TOTAL	4,754.7	

Kodiak - Parks & Recreation

FY	Project	Amount ($000)	Source
84	East Addition Park	400.0	EDR
82	City Park Improvement	242.5	
	TOTAL	642.5	

Kodiak - Education

FY	Project	Amount ($000)	Source
85	Fisheries Industrial Tech. Center	500.0	EDR
84	KCC - Equipment	16.0	
83	KCC - Cross Cultural Form	50.0	
81	KCC - Adult Learning Center (GO Bonds)	2,000.0	
80	KCC - Spring System	64.0	
79	KCC - Classrooms (GO Bonds)	750.0	
79	KCC - Library (GO Bonds)	525.0	
	TOTAL	3,905.0	

Cultural Dynamics

Kodiak - Health & Social Service

FY	Project	Amount ($000)	Source
84	EMS Equipment	18.0	EDR
84	Energy Conservation Audits & Grants	76.9	
83	Daycare Center	250.0	
82	EMS Communication Equipment	112.0	
82	Battered Women Shelter	275.0	
79	Kodiak Council on Alcoholism	9.0	
79	Women's Resource Center	30.0	
	TOTAL	770.9	

Kodiak Island Borough - Highways

FY	Project	Amount ($000)	Source
85	Road Project Construction	441.0	EDR
84	Borough Road Dev.	300.0	
84	Sawmill/Lakeview Drive	120.0	
83	Lilly Driuve Construction	740.0	
83	Eider Street Construction	350.0	
82	Sawmill Circle/Lakeview Drive	581.0	
	TOTAL	2,532.0	

Cultural Dynamics

Kodiak Island Borough - Ports & Harbor

FY	Project	Amount ($000)	Source
85	Kodiak Pier III Emergency Repair	3,000.0	EDR
	TOTAL	3,000.0	

Kodiak Island Borough - Water/Sewer/Solid Waste

FY	Project	Amount ($000)	Source
85	Kodiak Island Lake Water/Sewer	1,810.0	EDR
82	Kodiak Island Lake Water/Sewer	3,518.8	
81	Solid Waste Study	25.0	
	TOTAL	5,353.8	

Kodiak Island Borough - Fish & Wildlife

FY	Project	Amount ($000)	Source
81	Kodiak-Afognak Fish Pass Dev.	197.0	EDR
	TOTAL	197.0	

Cultural Dynamics

Kodiak Island Borough - Village Projects

FY	Project	Amount ($000)	Source
85	Village Projects	264.0	EDR
85	Energy Audit A, LB, OH, PL*	45.87	
85	Village Fisheries Education	35.0	
83	Kodiak Village Fisheries	185.0	
81	KANA Fisheries Education Program	145.0	
	TOTAL	674.87	

* Total distributed among villages of Akhiok, Larsen Bay, Old Harbor and Port Lions

Kodiak Island Borough - Community Facilities

FY	Project	Amount ($000)	Source
85	Kodiak Island Hospital Equipment	100.0	EDR
84	Kodiak Island Hospital Equipment	95.5	
84	Fire Trucks Bell Flats/Women's Bay	200.0	
83	Kodiak Island Hospital Equipment	350.0	
82	Kodiak Island Hospital Equipment	130.0	
82	Kodiak Island Hospital Repairs	250.0	
82	Per Capita Entitlement*	2,228.5	
80	Kodiak Island Hospital Equipment	43.0	
78	Kodiak Island Hospital Equipment	15.0	
78	Kodiak Island Hospital Equipment	20.0	
	TOTAL	3,432.0	

* Per Capita Entitlement is included here although it could be used for a variety of projects as determined locally.

Cultural Dynamics

Kodiak Island Borough - Energy/Power

FY	Project	Amount ($000)	Source
83	Monaska Dam	340.0	EDR
83	Terror Lake-APA Project	10,500.0	
82	Terror Lake-APA Project	71,500.0	
82	APA Study of Borough Electrical Needs	100.0	
82	Kodiak Waste heat Cogen. Proj.	2,500.0	
81	Mennonite Hydro Proj.	200.0	
80	Terror Lake Study	500.0	
80	Mennonite Creek Hydro Proj.	90.0	
80	APA-Revolving Fund Loan for Terror Lake Project	1,050.0	
80	APA-Terror Lake	2,000.0	
80	Hydro Power, Larsen Bay, Old Harbor	80.0	
	TOTAL	88,860.0	

Kodiak Island Borough - Parks/Recreation

FY	Project	Amount ($000)	Source
85	Kodiak State Fair Improvement	82.0	EDR
85	Kodiak State Park Dev.	25.0	
84	Kodiak State Park Improvement	35.0	
83	Kodiak State Fair & Rodeo	65.0	
82	Kodiak State Fair & Rodeo	550.0	
82	Kodiak State Park Dev.	969.5	
79	Kodiak State Fair & Rodeo	12.0	
79	Chiniak Highway Wayside (GO Bonds)	25.0	
79	Anton Larsen Bay Boat Ramp (GO Bonds)	60.0	
	TOTAL	1,823.5	

Kodiak Island Borough - Schools/K-12

FY	Project	Amount ($000)	Source
85	High School Audit. & Main Elementary School	900.0	EDR
84	Kodiak Island School Upgrade	169.0	
84	Kodiak School Auditorium Design	294.0	
83	Kodiak Schools Improvement	400.0	
82	Chiniak School	2,000.0	
80	Chiniak School Repairs	18.6	
	TOTAL	3,781.6	

Kodiak Island Borough - Miscellaneous Unclassified/Area Wide Planning

FY	Project	Amount ($000)	Source
85	Planning	40.0	CRA
83	Coastal Sensitivity Analysis	140.0	CRA
83	OCS Information Office	35.0	CRA
82	Onshore Impact Study	37.0	CRA
80	Tsunami Study	479.0	
	TOTAL	731.0	

Cultural Dynamics

Akhiok

FY	Project	Amount ($000)	Source
85	Dock Facility Access Road	560.0	EDR
85	Equipment Storage Shed	100.0	EDR
85	Energy Audit	*	
84	Generator	60.0	EDR
84	Firehall & Firefighting Equipment	50.0	EDR
84	Sanitary Landfill Development	100.0	EDR
84	Airport Upgrade	1,425.0	DOT
83	Engineering/Design for a BFSF	15.0	CRA
82	Per Capita Entitlement**	83.3	
81	Renovation of Community Building	32.1	CRA
	TOTAL	2,425.4	

* Included under Kodiak Island Borough - Village Projects. Total of $45.87 distributed among villages of Akhiok, Larsen Bay, Old Harbor, and Port Lions.

** Per Capita Entitlement could be used for capital projects, operations and maintenance, or social services.

Cultural Dynamics

Karluk

FY	Project		Amount ($000)	Source
85	Electrification System		233.0	EDR
85	Equipment Storage Shed		100.0	EDR
85	Street Lighting		27.0	EDR
84	Boardwalks		50.0	EDR
83	Comp. & CIP Plan for Karluk		20.0	CRA
83	Complete BFSF		40.0	CRA
82	Erosion Control		50.0	EDR
82	Health Clinic		150.0	EDR,CRA
81	School	GO Bonds	960.0	EDR
81	Bulk Fuel Storage		60.0	CRA
		TOTAL	1,690.0	

Cultural Dynamics

Larsen Bay

FY	Project	Amount ($000)	Source
85	Boat Harbor	450.0	EDR
85	Water/Sewer Upgrade	320.0	
85	Energy Audit	*	
85	Multi-Purpose Bldg	100.0	CRA
85	Bulk Fuel Storage Suppl.	20.0	CRA
84	Electrical System	148.0	EDR
84	Water/Sewer Dev.	50.0	EDR
83	Bulk Fuel Storage	80.0	CRA
83	Fire Truck	85.0	CRA
82	Solid Waste Facility	60.0	EDR
82	Heavy Equipment	95.0	CRA
82	Per Capita Entitlement**	133.1	
81	Hydro Project	200.0	EDR
81	Hydro Project	200.0	EDR
80	Hydro Project/LB/Old Harbor	(80.0)	EDR
79	School Construction	1,637.1	EDR
	TOTAL	3,578.2	

( ) Not in Total; included in Kodiak Island Borough, Energy/Power

* Included under Kodiak Island Borough - Village Projects. Total of $45.87 distributed among villages of Akhiok, Larsen Bay, Old Harbor, and Port Lions.

** Per Capita Entitlement could be used for capital projects, operations and maintenance, or social services.

Cultural Dynamics

Old Harbor

FY	Project	Amount ($000)	Source
85	Storm Drain Renovation	28.7	CRA
85	Energy Audit	*	EDR
85	Airstrip Extension	300.0	EDR,DOT
85	Erosion Control	250.0	EDR
85	Road Extention	375.0	EDR,DOT
84	Sewer Renovation	800.0	EDR
83	Old Harbor High School Residing	50.0	EDR
82	Airport Relocation Study	100.0	EDR
82	Airport Repair	150.0	EDR
82	Harbor Improvements	365.0	EDR
82	Grader	90.0	EDR
82	Per Capita Entitlement**	269.5	
81	Hydro Project	990.0	EDR
81	Larsen Bay/Old Harbor Hydro Proj.	(80.0)	EDR
80	Float Facilities	250.0	EDR
80	Boat Harbor Repair	200.0	EDR
	TOTAL	4,118.2	

( ) Not in Total; included in Kodiak Island Borough - Energy/Power

* Included under Kodiak Island Borough - Village Projects. Total of $45.87 distributed among villages of Akhiok, Larsen Bay, Old Harbor, and Port Lions.

** Per Capita Entitlement could be used for capital projects, operations and maintenance expenses, or social services.

Cultural Dynamics

Ouzinkie

FY	Project	Amount ($000)	Source
85	Water/Sewer Upgrade	150.0	EDR
85	Community Center	129.13	EDR
84	Generator	60.0	EDR
83	Fire Station	100.0	EDR
83	Municipal Building Improvements	100.0	EDR
82	Bulk Fuel Storage Facilities (ROA 60.0, BFSF 39.0)	100.0	CRA
82	Road Equipment	205.0	EDR
82	Airport	2,220.0	DOT
82	Harbor Study	25.0	EDR/DOT
82	Erosion Study	50.0	EDR/DOT
82	Fire Engine	90.0	EDR
82	Waste Heat Project	700.0	EDR
82	Per Capita Entitlement*	137.1	
80	Airstrip Construction	73.1	EDR
80	School	100.0	EDR
79	School	1,001.0	EDR
	TOTAL	5,240.33	

* Per Capita Entitlement could be used for capital projects, operation and maintenance expenses, or social services.

Cultural Dynamics

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Port Lions

FY	Project	Amount ($000)	Source
85	Energy Audit	*	EDR
85	Bayview Drive Water/Sewer	264.0	EDR
85	Fire Hydrant System	35.0	EDR
85	Clinic Addition	69.0	CRA
84	Bayview Drive Sewer	132.0	EDR
84	Inner Harbor Facility Suppl.	1,650.0	EDR
82	Fire Truck	60.0	EDR
82	Hydropower	1,400.0	EDR
82	Dock Electrification	40.0	CRA
82	Design/Construction Airport Imp.	1,219.0	DOT
82	Per Capita Entitlement**	170.4	
81	Boat Harbor GO Bonds	1,100.0	EDR
81	Hydro Project	200.0	EDR
81	Breakwater Reconst./dredging	1,100.0	EDR
81	Access Road	848.6	DOT
78	Breakwater	80.0	DOT
	TOTAL	8,368.0	

* Included under Kodiak Island Borough - Village Projects. Total of $45.87 distributed among villages of Akhiok, Larsen Bay, Old Harbor, and Port Lions.

** Per Capita Entitlement could be used for capital projects, operations and maintenance expenses, or social services.

Cultural Dynamics

Chignik Bay

FY	Project	Amount ($000)	Source
85	Clinic/Emergency Shelter	90.0	EDR/BBNC
85	Pile Driver	100.0	EDR
85	Water/Sewer/Solid Waste	578.0	EDR
84	Fire Truck	82.0	CRA
84	Airport	750.0	DOT
84	Chignik Footbridge	50.0	DOT
83	Water Line Improvement	100.0	CRA
82	Weir & Bulkhead	100.0	EDR
82	Harbor Study	25.0	EDR/DOT
82	Per capita Entitlement*	178.0	CRA
82	Generator	266.0	CRA
81	School Multi-purpose Room	700.0	EDR
80	Airport Road	50.0	EDR
79	Field Station & Weir	500.0	EDR
	TOTAL	3,569.0	

* Per Capita Entitlement could be used for capital projects and maintenance expenses, or social services.

School construction estimate, Lakes and Peninsula REAA. High school classroom, 1979-80, approximately $300,000; added gym, 1981, approximately $895,000 (partially reflected in 1981 DOE appropriation for $700,000, above)

Cultural Dynamics

Chignik Lake

FY	Project	Amount ($000)	Source
85	Bulk Fuel Storage Facility	80.0	CRA/BBNC
85	School Supplemental	150.0	EDR
84	Airport	750.0	DOT
82	Satellite TV Dish	25.9	CRA
82	Per Capita Entitlement*	138.0	CRA
82	Upgrade Roads/Trails, Equipment	25.9	BBNC
82	School Completion	113.8	EDR
82	Class/Media	816.0	EDR
80	School Completion	100.0	EDR
	TOTAL	2,199.6	

* Per Capita Entitlement could be used for capital projects and maintenance expenses, or social services.

School Construction estimate, Lakes and Peninsula REAA. School burned in FY 81 replaced with new school, costing approximately $2.5 million (partially reflected in appropriations above).

Cultural Dynamics

Chignik Lagoon

FY	Project	Amount ($000)	Source
85	Major Repairs, School	130.0	EDR
85	Feas. Study Engineering Bulk Fuel Storage	15.0	CRA,BBNC
85	Upgrade of Sewer Design/Const. Water System	728.0	BBNC/EDR
84	Packer's Creek Bridge Feas. Study	15.0	BBNC,CRA
82	Solid Waste Facility	60.0	EDR
82	Health Clinic Construction	256.0	EDR
79	Chignik Lagoon Local Services Road and Trails Program (40.0 of this is CRA LG)	13.0	
	TOTAL	1,217.0	

School Construction Estimate, Lakes and Peninsula REAA. 1980, generator building, approximately $50,000.

Cultural Dynamics

Ivanof Bay

FY	Project	Amount ($000)	Source
85	Electrical Generating System	100.0	BBNC,CRA
83	Bulk Fuel Storage	50.0	BBNC,CRA
82	Heavy Equipment	100.0	CRA
81	Local Service Roads & Trails	27.0	DOT
80	Shop	65.0	EDR
	TOTAL	342.0	

School Construction Estimate, Lakes and Peninsula REAA. Remodeling 1977-78, approximately $80,000 for new library room.

Cultural Dynamics

Perryville

FY	Project	Amount ($000)	Source
85	Electrification	74.84	CRA,BBNC
84	Caterpillar	63.0	EDR,CRA
83	Generator, Electrical Gear, and Compacator	104.67	CRA,BBNC
82	Electrification	145.0	CRA,EDR,BBNC
82	Class/Library	725.0	EDR
82	Per Capita Entitlement*	99.0	CRA
82	Local Service Roads & Trails	281.0	DOT
80	Class/Library	99.9	EDR
80	Airport Repairs	50.0	EDR,BBNC
79	Elementary School Renovation	16.0	EDR
78	Generator Housing	13.52	CRA
	TOTAL	1,671.93	

* Per Capita Entitlement could be used for capital projects, operation and maintenance expenses, or social services

School construction estimate Lakes and Peninsula REAA. 1980 added new gym, approximately $700,000; 1983, converted gym to classrooms and built new gym, $960,000. (Some portion of this probably reflected in 1980 and 1982 appropriations, above.)

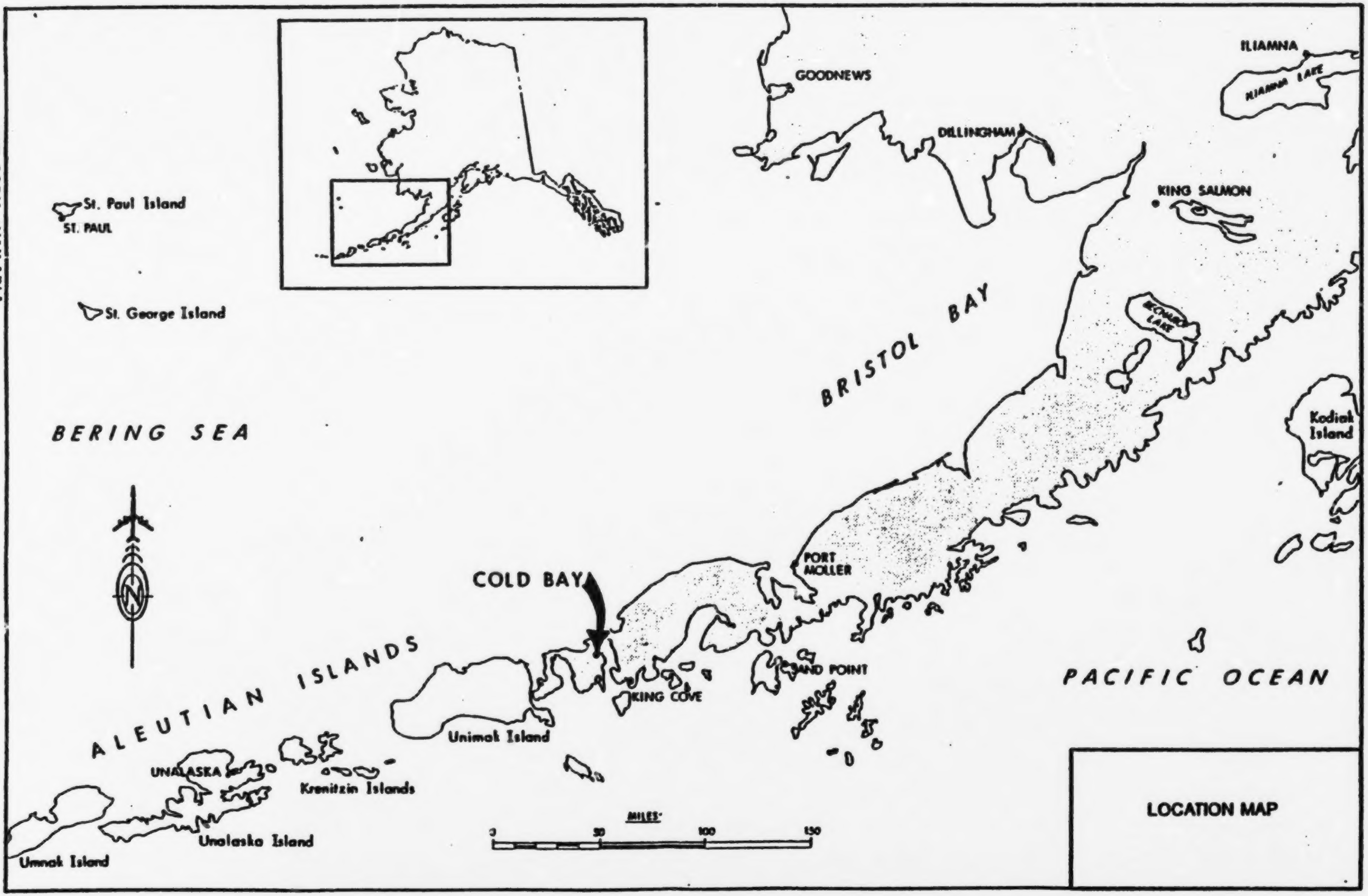
Cultural Dynamics

Cold Bay

FY	Project	Amount ($000)	Source
84	Muni Building Design/Eng	50.0	EDR
83	School Addition	1,800.0	EDR
82	Per Capita Entitlement*	228.0	CRA
82	Ambulance	36.0	EDR,CRA
82	Clinic Construction	256.0	CRA,EDR
80	Mooring Facilities	2,700.0	EDR
80	Runway Resurfacing	2,250.0	EDR
78	Caribou Transplant	15.0	EDR
	TOTAL	7,335.0	

* Per Capita Entitlement could be used for capital projects, operation and maintenance expenses, or social services

Cultural Dynamics


GOODNEWS
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BRISTOL BAY
BERING SEA
Kodiak Island
PORT MOLLER
COLD BAY
ALEUTIAN ISLANDS
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LOCATION MAP

SOURCE: Cold Bay Airport Master Plan

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FIGURE 14. Cold Bay Location

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APPENDIX B.

Cold Bay

This Appendix presents background information on the enclave at Cold Bay. Current data for the community will be found in the body of this volume, especially Chapter V.

Cold Bay is a unique community. Established as a military base in the early years of the Second World War, it continues to be a location where individuals are sent for a tour of duty but seldom settle. A recent study of the community was conducted by Petterson, et al. (1983). According to this report:

> Historically Cold Bay has been under the almost complete control of agencies and companies, both governmental and private, which are basically external to the community. The town originated as a military encampment under federal control; the federal government constructed the airport there in World War Two and it is that facility which has been the lifeblood of the community ever since (Petterson, et al. 1983:18).

The community is made up predominantly of Anglo, western-oriented technicians and professional workers. Only a small number have lived there for more than a half-dozen years. Permanent settlement is complicated by a shortage of available land for private ownership and home-building.

Because it is an enclave devoted to transportation and communication services, the community has a population subject to the vagaries of the employers' fortunes. According to Cloe's history of the Air Force in Alaska, there was one permanent resident of Cold Bay in 1940 (a Navy pensioner). Several thousand people were involved in the construction of the airport in the early 1940s (Cloe 1984:45, 52). In 1960 the U. S. Census reported 86 residents. During the Vietnam War, the number was estimated at between 250 and 280. The 1970 count was 256 and in 1980, 228. The Alaska Department of Community and Regional Affairs figure for 1985 was 250. (See Table B-1.) At the time of the 1970 census the proportion of men was 75.4% to 24.6% women. The 1982 population was estimated by Petterson's research team to be 226, about 67% male and 33% female. The Aleut population was judged negligible by Petterson's team.

TABLE B-1

COLD BAY POPULATION

Total Population

1960 thru 1985

Year	Number
1960	86
1970	256
1980	228
1985[1]	250

Population by Age and Sex

1970 and 1980

Age Cohort	Female 1970	Female 1980	Male 1970	Male 1980
0-5	10	11	8	7
5-19	16	16	26	20
20-44	25	42	141	89
45-64	12	12	18	30
65 and over	0	0	0	1
Totals	63	81	193	147

SOURCES: U. S. Census; [1] Alaska Department of Community and Regional Affairs 1986 and file data.

Economy

The local economy centers around three sectors: transportation, especially the airport; communications; and government (state, federal, and local). In 1985 the transportation firms included Reeve Aleutian Airways, Peninsula Airlines, and a local truck rental firm. Communications companies were RCA, Alascom, and the Interior Telephone Company. Federal agencies were the FAA, the National Weather Service, the Fish and Wildlife Service, and the Post Office. State agencies included the Department of Transportation and Public Facilities (DOT), which administered most of the state-owned land on which the town is situated; the Department of Fish and Game; the regional rural education district; and the magistrate. Local government had one half-time employee. Please see Chapter V for a discussion of the fiscal implications of state and federal expenditures.

A significant change between 1982 and 1986 was the withdrawal of all federal military personnel with the deactification of the Air Force post. (See Table B-2.)

The Flying Tigers Lines (FTL), which used to be an important segment of the transportation industry, for many years dominated the service sector. FTL owned and operated the hotel, the store, the bar, and the restaurant. About the only needs they did not meet were for fuel--which was sold by Reeve (both heating fuels and gasolines)--and electric power. In 1985, FTL's 25 year lease with the state expired, and these facilities were then owned and operated by Reeve Aleutian Airways. Electricity, which used to be provided by the Northern Power Company, came from GNK, a company headquartered in Sand Point. Up-dates of Petterson's 1982 labor force categorization are presented in Tables B-3.

Social structure

Petterson, et al. identify six characteristics of the Cold Bay social structure. 1) The importance of kinship is minimal. 2) Families are a minority; single individuals predominate. 3) Friendship is the most important basis for interpersonal relationships. 4) Workplace relations, which in turn are bolstered by residence patterns (one lives near one's work companions), are a central factor in determining friendships. 5) There are few voluntary associations. 6) Most residents have strong links outside Cold Bay. The authors characterize the social structure as "outer directed; it is centrifugal" (Petterson, et al. 1983:104).

Political structure

The community incorporated as a second class city in January of 1982, so a formal local political structure is a recent creation. Prior to this time, political power was vested in the state, as the major landowner. Petterson's team observed that the state Department of Transportation and Public Facilities still seemed very much the *de facto* political institution on the community.

TABLE B-2

COLD BAY EMPLOYMENT ESTIMATES

Changes in Federal Employment in Cold Bay 1982[1] and 1986[2]

Employing Agency	Year 1982	Year 1986
Federal Aviation Administration	16	14
National Weather Service	5	5
Fish and Wildlife Service	4	5
Postal Service	2	2
U. S. Air Force	16	0
Totals	43	26

Number in Labor Force 1982 and 1986

Employment Sector	Year 1982	Year 1986
Government		
Federal Military	16	0
Federal Civilian	27	26
State and Municipal	19	19
Transportation and Service	48	45
Communications	31	22
Other	13	8
Totals	154	120

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SOURCES: [1] Pettersen, et al. 1983
[2] Personal communications from agency and employer's offices to R. Krause.

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TABLE B-3

COLD BAY LABOR FORCE BY SECTOR, 1986

Employment Sector	Number of Employees	Percent of Total[1]
Government		
Federal		
Federal Aviation Administration	14	11.6
National Weather Service	5	4.2
Fish and Wildlife Service	5	4.2
U. S. Postal Service	2	1.6
Subtotal, Federal Government	26	21.6
State		
Department of Transporation	6	5.0
Department of Fish and Game	6	5.0
Rural Education Attendace Area	5	4.1
Magistrate	1	.8
Municipal		
Clerk	1	.8
Subtotal, State and Local Governments	19	15.7
Private industry		
Transportation and Services		
Cold Bay Truck Rental	2	1.6
Peninsula Airlines	10	8.3
Reeve Aleutian Airways[2]	33	27.5
Subtotal	45	37.5
Communications		
Interior Telephone Company	1	.8
Alascom	1	.8
R. C. A.[3]	20	16.7
Subtotal	22	18.3
Manufacturing/Processing		
Seawest	1	.8
Northern Peninsula Fisheries	5	4.2
Subtotal	6	5.0
Construction		
Well Digger	1	.8
General laborer	1	.8
Subtotal	2	1.6
TOTAL	120	
SUMMARY: Government agencies	45	37.5%
Private employees	75	62.5%

[1] May not add exactly because of rounding.

[2] Provides transportation services; also owns and operates bar, hotel, and restaurant.

[3] Estimated figure; proprietary information provided by R.C.A. as 20 or less.

SOURCE: Table B-2

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Social control

Social control is exercised through informal channels; there was no city policeman or state trooper in the town at the time of the Petterson team visit. A DOT security person served as the only law enforcement official; this individual's presence helped reinforce the perception that the state still holds a fair proportion of the power in Cold Bay.

Religion

There is a chapel in the community that attracts a small following at its non-denominational services. Petterson's team found the services to have a strong Baptist cast.

Education

The local school provides a program from kindergarden through grade 12. In 1982, four teachers instructed between 48 and 55 pupils, all drawn from Cold Bay. The building, first put up in 1961, has been remodeled and expanded twice (in 1967 and 1980). A multi-purpose room was added in the early 1980s.

Health care

A new clinic was being readied in 1982 when Petterson's researchers visited the town. Once completed, the residents hoped to make arrangements for a doctor to staff it through regular visits. In the interim, care was provided mainly by Emergency Medical Technicians (there were 4). Serious illnesses are evacuated to a hospital.

> The population of Cold Bay is unusually young and in good health. The nature of the town as a transient center, full employment of the population, and youth all contribute to good mental and physical health. (Petterson, et al. 1983:110)

Social services

Social problems were not visible and few social services are provided. Even alcohol abuse does not seem to be an issue.

> Cold Bay is not so much disintegrative as it is integrated into a much larger social world than the town itself. The people ... do not lack social integration, they simply do not depend on Cold Bay for it (Petterson, et al. 1983:113).

Recreation

Recreational activities fell into four categories. 1) Use of vehicles. Many kinds of recreational vehicles are owned: airplanes, boats, pickup trucks, 4-wheel and all-terrain vehicles, three-wheel cycles. 2) Electronic entertainment. Video recorders, video games, and stereo players are most popular. Television is limited, as is radio. 3) Outdoor activities, including subsistence fishing and hunting. 4) Taking a trip. To Cold Bay residents this can mean a weekend in Anchorage, or a longer visit to other states.

The nature of the community of Cold Bay places it in sharp contrast to the other communities in the study area.

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APPENDIX C

THE SHUMAGIN SEISMIC GAP

This supplement calls attention to information concerning potential tectonic activity in the region just west of the study area. Activity here could potentially affect the whole of the North Pacific.

The Shumagin Island area was first identified as a seismic gap in 1970, and since that time further scientific studies have documented the probability of a great earthquake in that vicinity. Several key references are included in the bibliography of this report.

A seismic gap is defined as "a portion of a convergent or transform plate boundary which has not been ruptured by a large ($M > 7.0$) earthquake for several tens of years. It is therefore a region of high potential for the occurrence of a large future earthquake. Identification of seismic gaps is based on observations regarding tectonic setting, earthquake history, and temporal progression of seismic activity" (Davies and House 1979:4583). Great earthquakes have tended to rupture east to west, beginning at the western end of the previous rupture zone. Given the location of previous major earthquakes, and the absence of a great one in the area of the Shumagin Islands, makes it a likely site of a large earthquake "in the next 10 or few tens of years," as noted by Kelleher in 1970. Subsequent to this first identification, a network of 9 seismic stations were established in 1973 and seismic activity has been monitored.

One of the unresolved questions relative to the gap is whether or not the Unalaska segment ruptured in 1957. If it did not, then this area "would be a seismic gap with a high seismic potential and hence, could pose significant seismic and tsunami hazards for the eastern Aleutians in the near future" (House, Sykes, Davies, and Jacob 1981:90). By 1981 it had been established that the Shumagin seismic gap had not ruptured during a great earthquake since at least 1899-1903. Then, as in 1970, it was stated a "high probability exists for a great earthquake to occur within the Shumagin Gap during the next one to two decades." Further, this study stated

> the Shumagin Gap is one of two major gaps along the United States portion of the Alaska-Aleutian plate boundary and is one of the few areas in the United States where processes leading to a great earthquake are likely to be observed within a reasonable span of time (Davies, Sykes, House and Jacob 1981:3821).

If the Shumagin Gap ruptures in a single great earthquake, it could have a magnitude of about 8.4. Or, if it combined with the Unalaska Gap to the west, the event could reach as large at 9.0. Yet another alternative possibility, given the information available, would be a series of large (but not great) earthquakes with a magnitude of 7.2. to 7.8. In any of the three probable events identified, large tsunamis are likely to be generated with run-up waves heights of several tens of meters along the shorelines of the rupture areas (Davies, et al. 1981:3850).

Another, more recent research report, provides the computed probabilities for future great earthquakes in the Aleutian arc.

> Given a probability distribution and date of the last great earthquake in each arc segment.. we obtain for the next two decades high probabilities (99 to 30%) for great earthquakes in the Shumagin, Yakataga, Unalaska and Kommandorski seismic gaps (Jacob 1984).

Important basic uncertainties continue because of lack of great time depth and historical records and whether the recurrence times are "normally, log-normally or otherwise distributed." However, Jacob concludes that "the average recurrence periods for great Aleutian earthquakes measure approximately 80 years.

In seismic gaps with no great earthquakes for the past 80 years or more, the conditional probabilities for great events in the next 20 years are significantly higher than in recently ruptured zones (99 to 30% versus 17 to 9%). The Shumagin, Yakataga, and perhaps the Unalaska seismic gaps appear to have the highest presently known probabilities rates for a great earthquake anywhere in the U.S. The exact values for the higher probabilities are, however, somewhat uncertain because the short record of seismicity in the Aleutians does not define well the statistical behavior of recurrence periods" (Jacob 1984:298).

On November 19, 1985, a series of events led to a memorandum from the Director of the Division of Geological and Geophysical Surveys and from John Davies, State Seismologist, to the Governor of Alaska. This document reported a sequence of four moderate earthquakes during a 5 week period from October 9 to November 14, 1985 near the eastern edge of the Shumagin seismic gap. Since the area is, at least from a statistical perspective, overdue for another great earthquake, the memorandum recommended that the increased level of concern be made known to key officials responsible for emergency preparedness.

The Division of Geological and Geophysical Surveys prepared a press release for November 19, 1985 summarizing the basis for concern and alternative scientific interpretations of the data. On November 22, 1985, Governor Sheffield directed the Division of Emergency Services to increase public awareness of the possibility of seismic disturbances. Since that time, seismic activity in the area has quieted down, a greater sense of awareness seems established, and renewed efforts are being made to work with the communities on emergency plans.

The information is included here because the communities in the study area are located on low-lying coastal areas, extremely vulnerable to the tsunami that could be generated by a large earthquake in the Shumagin Gap region.

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